Farm Chemicals

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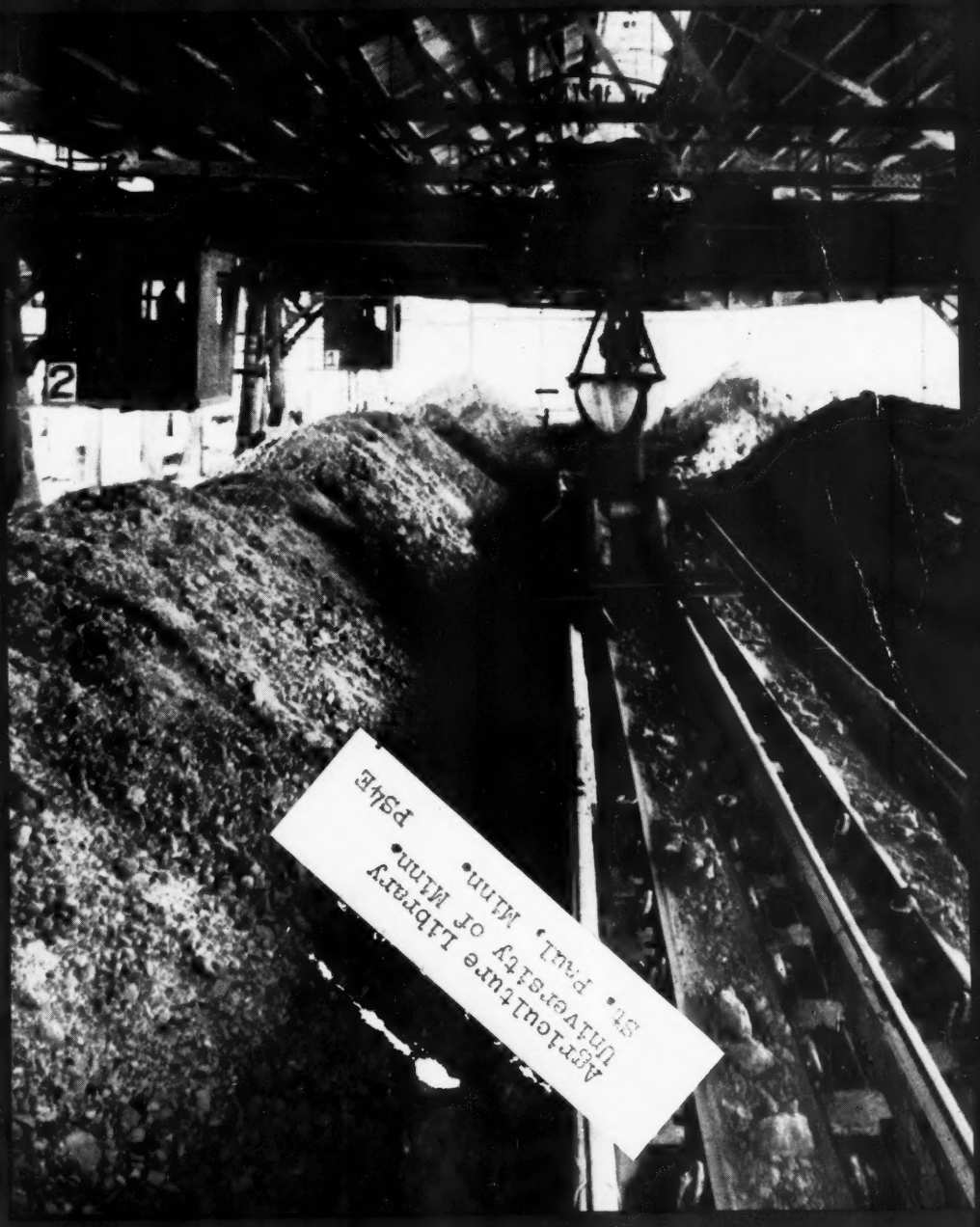
f the Industry



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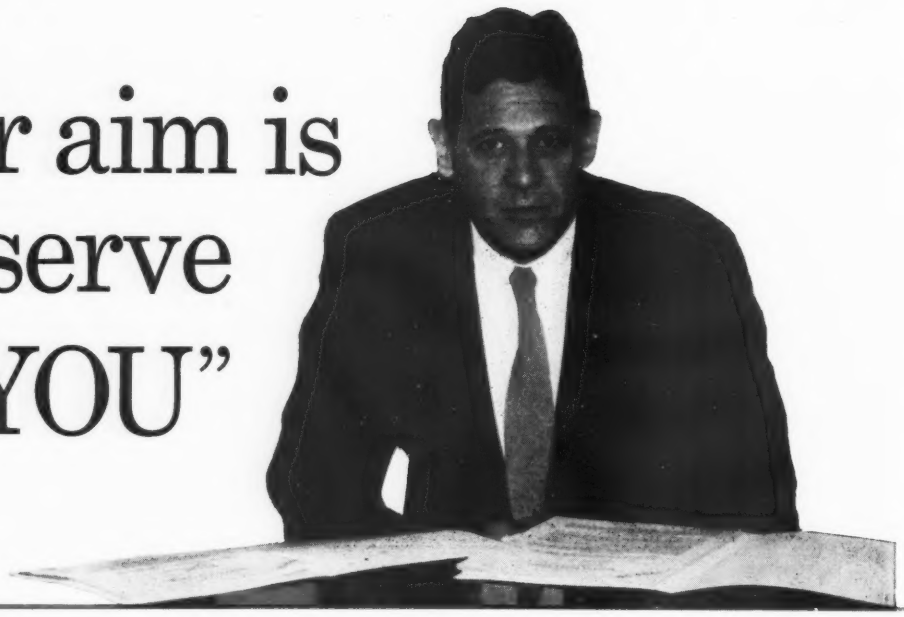
Vol. 119 No. 7 JULY 1956 50 Cents

"Our aim is to serve YOU"



"The beginning of a new fertilizer year is a good time for the folks here at Nitrogen Division, Allied Chemical & Dye Corporation, to say *'Thank You!'* for past patronage... and to express a desire to continue to serve you with nitrogen materials adapted to your specific production programs.

"In addition to supplying the most complete line of nitrogen materials on the market, we work in other ways to assist the fertilizer industry. Here are some of the things we are doing:

"Nitrogen Division is continuing its powerful advertising campaign to encourage farmers to use more fertilizer to reduce crop production costs. Directed to the attention of 3½ MILLION readers of farm magazines, the theme of this campaign is: *Fertilizer Grows Farm Profits!* It helps sell your product to farmers.

"The same Nitrogen Division research that originated Nitrogen Solutions continues to work towards better and lower cost forms of nitrogen to help you manufacture better fertilizers at a greater profit.

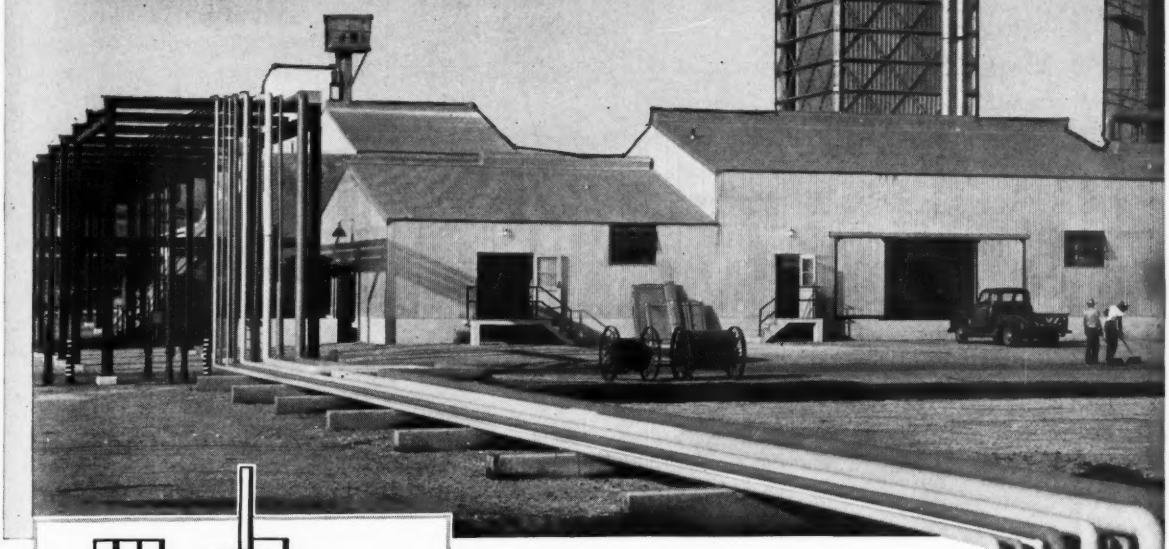
"Our technical men, skilled in ammoniation and other fertilizer production problems, are always ready to assist our customers. Techniques and knowledge gained in 27 years of Solutions experience are as near to you as your telephone. We are doing our best to help to make 1956-57 a better year for the fertilizer industry."

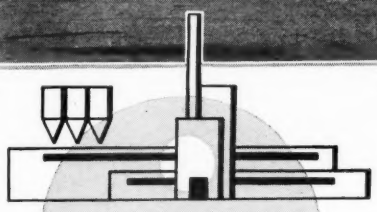
HUGO RIEMER, *President*

NITROGEN DIVISION Allied Chemical & Dye Corporation
40 Rector Street, New York 6, N. Y.

LINK-BELT HELPS BREA NITRATE PLANT GET "on stream"

PRILLED AMMONIUM NITRATE is produced at this modern plant of Brea Chemicals, Inc., Subsidiary of Union Oil Company of California, Brea, California. Link-Belt equipment includes special dust-tight oscillating conveyors, coating drum, vibrating screens, pre-dryer and dryer, cooler and belt conveyors. In addition to ammonium nitrate, Link-Belt's vast experience applies to dry-mix, superphosphate, ammonium phosphate, ammonium sulphate, urea, granular and other types of fertilizer.





LINK-BELT "turn-key" SERVICE unlocks new efficiencies in fertilizer production

Under this inclusive 5-point program, LINK-BELT will:

1. **PILOT THE PROCESS,** using our complete laboratory and test facilities.
2. **DESIGN THE SYSTEM** as an efficient, integrated operation conforming to your exact needs.
3. **FABRICATE THE EQUIPMENT.** Link-Belt makes a complete line—will also supply special requirements.
4. **ERECT THE PLANT,** providing crews and supervisory service.
5. **START THE OPERATION,** with field engineers ready to make final adjustments.

IN addition to normal production demands, requirements of this new Brea Chemicals, Inc. plant called for special processing equipment and dust control efficiency. Through Chemical and Industrial Corporation, engineering-construction contractor, Link-Belt supplied standard and specialized equipment to satisfy these requirements . . . has helped maintain full-capacity output and top product quality.

Link-Belt stands ready to cooperate with your engineers or consultants in supplying the exact equipment your process requires. Or, with a unique 5-phase "turn-key" service, Link-Belt can set up your entire operation . . . handling every last detail under a single, all-inclusive contract. To learn more of the savings this service can bring you, call your Link-Belt office. Or write for Book 2459.

LINK-BELT

PLANTS AND EQUIPMENT FOR THE FERTILIZER INDUSTRY

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,147

Farm Chemicals

JULY, 1956
No. 7
Vol. 119

Pioneer Journal of Farm Chemicals Industry, Est. 1894

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A magazine national in scope and circulation and devoted to manufacturers, mixers and formulators of plant foods and pesticides. It has a free controlled circulation within specified segments of the industry.

Subscription rates to all others are: U.S., its possessions, Canada, Cuba and Panama—$6.00; Mexico and foreign: $7.50. Single Copy—$.50. Back Numbers $1.00.

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In this issue . . .

The first convention of the National Plant Food Institute was an outstanding success attracting some 1100 members and guests. Our report on the annual meeting begins on page 39 and covers the major talks and events of the three day affair. Of special interest will be the remarks of Sen. J. W. Fulbright on US foreign policy; Drs. Bohlen & Beal on what influences the farmer; and election of new officers and board members.

A newly completed Commerce Department study shows that the best opportunities for expansion of pesticide sales lie in specialized products for both domestic and overseas use. FC's Washington editor has reviewed the lengthy report and, on page 45 is the first part of his analysis. The article will be concluded in the August issue.

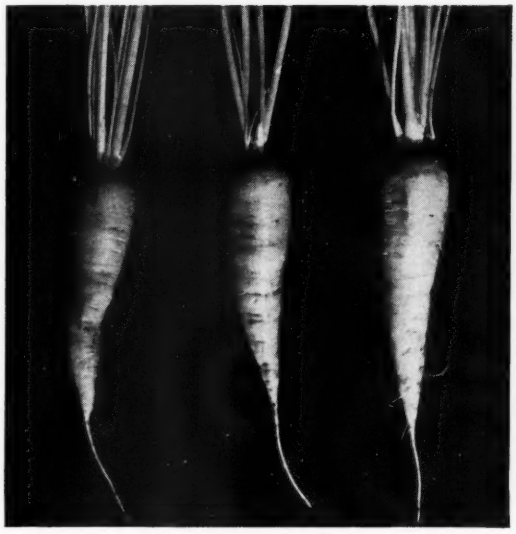
USDA's fertilizer consumption report appears in its entirety starting on page 49. A month later than usual, it confirms the well known fact that 1954–55 was not a particularly good fertilizer year—tonnage of both plant foods and nutrients showed a drop from the previous crop year.

On the editorial page we review the latest report of Virginia's control official, Rodney C. Berry, on the fertilizer-pesticide mixtures situation. Little change appears evident in most areas; a few states still turn thumbs-down on use of these materials; most report some registrations.

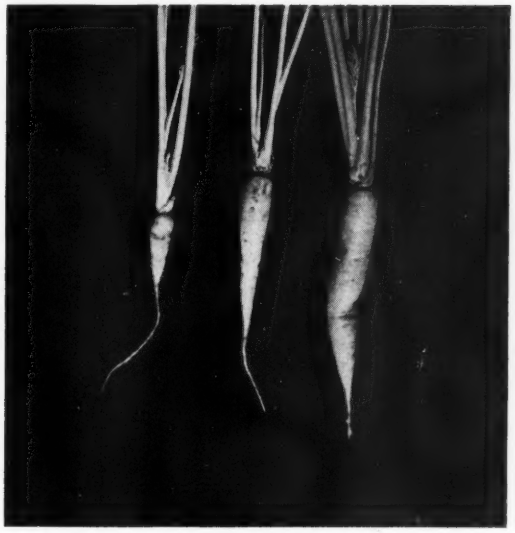
Cover story

Raw clay mined from beds near the Florida-Georgia border is mined, then stored in the huge building pictured on the cover, to await further processing. In the Minerals & Chemicals Corp. plant at Attapulgus, Ga., it is transformed from a grayish-green material into the light, cream colored carrier you use in formulating pesticides.

IN CARROTS, POTASH-ENRICHED FERTILIZERS MAKE THE DIFFERENCE



with sufficient potash



without sufficient potash

Healthy, vigorous plants are the reward of the farmer who keeps his soil enriched with balanced fertilizers. Potash in these balanced fertilizers increases crop resistance to disease and produces a larger yield of finer quality crops.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 60% K_2O MIN.

SUNSHINE STATE POTASH · PRODUCT OF NEW MEXICO U.S.A.

REG. U. S. PAT. OFF.

UNITED STATES POTASH COMPANY
INCORPORATED
30 Rockefeller Plaza, New York 20, N. Y.
Southern Sales Office
Rhodes-Haverty Building, Atlanta, Georgia

Business & Management

. . . News of the Industry

New IMC Plant Food Factory for Minn.

International Minerals & Chemical Corp. will build a plant food manufacturing plant at Fairfax, Minn., Maurice H. Lockwood, vice president in charge of the Plant Food Div., announced recently.

The plant, to be located on a 42-acre tract west of Fairfax, is expected to be in operation for the Spring 1957 season.

Lockwood said that consumption of plant food in Minnesota has shown a substantial increase in recent years, and even greater increases are indicated for the future. The plant at Fairfax will provide additional fertilizer in the area and will place International in a better position to supply its present customers, as well as to serve a more extensive area surrounding Fairfax in south-central Minnesota.

PCB-USP Merger Okayed by Directors

Agreement by directors of Pacific Coast Borax Co. and United States Potash Co. to merge the two concerns recently was reported.

Name of the merged firm would be United States Borax & Chemical Corp.

Holders of U. S. Potash common stock, excluding the Borax group, will be offered one share of 4½ per cent preferred stock, $100 par value, and five shares of common stock in the merged firm in exchange for each five shares of U. S. Potash common.

Stauffer SE Sales Office Relocated

Stauffer Chemical Co. is transferring its Southeastern Regional Sales headquarters from Apopka to Tampa, Fla., John H. Kennedy, eastern sales manager, Agricultural Chemical Div., recently announced. The headquarters will be located in a new air-conditioned office building at 2009 Orient Road, Tampa.

Main reason for the move, according to M. T. Pearson, sales manager of the Southern area, is to locate the sales and technical service group adjacent to Stauffer's Tampa plant and laboratory, in anticipation of expanded operations and to better serve the Southeastern region. Warehouse stocks will still be maintained at Apopka.

Right: Henry Hansen, Tampa plant mgr., and Melton Pearson, SE sales mgr., at the new headquarters. Below: Aerial view of the Tampa facilities.

Alcoa Pres. Davis Invests in Re-Mark

Initial purchase of 25,000 shares of Re-Mark Chemical Co. preferred stock marks the entrance of Arthur Vining Davis, multi-millionaire chairman of the Aluminum Co. of America, into Florida's chemical industry.

Re-Mark Chemical now operates three plants—insecticide installations at Belle Glade and Miami, Fla., anhydrous ammonia and aqua ammonia at Hallandale, Fla. A sulpha mill is under construction at Belle Glade, Fla., and a Cuban plant is contemplated.

Preferred stock of the firm was originally issued in April, 1955, at $1.25 a share and present quotations are reported up to a high of $3.75 a share.

MCA Study Shows Need for Scientists

The United States faces a shortage of 457,000 scientists and engineers by 1965, according to a study by the Manufacturing Chemists' Association. More than 700 chemical industry representatives attending MCA's 84th annual meeting in June were told that the chemical industry alone will have a "probable shortage" of 93,000 scientists and engineers within 10 years.

Terming present and future shortages of technical manpower a "genuine threat" to growth and expansion of American industry, Glen Perry of DuPont Co., vice-chairman of the MCA education advisory committee, said that unless more young people take up scientific and technical careers it is likely that industrial expansion will "slow down to a walk, a crawl or stop."

Perry spoke in support of a proposed expansion of the association's present educational program. The proposal covers an initial five-year program to increase the interest of young men and women in careers in science.

Meet The Demand For High Analysis

Use

DAVISON'S

TRIPLE

Superphosphate

State Agricultural Experiment Stations and other authoritative sources are recommending fertilizers with ever increasing plant food units per ton. High analysis fertilizers are in demand because they give more for each fertilizer dollar. Meet this demand by incorporating Davison's New Triple Superphosphate in your formulation.

Davison's Triple Superphosphate has 45/46% available P_2O_5 and is supplied in the easy-to-use granulated form or run-of-pile.

Order Davison's Triple Superphosphate. For complete information, call or write.

Progress Through Chemistry

DAVISON CHEMICAL COMPANY

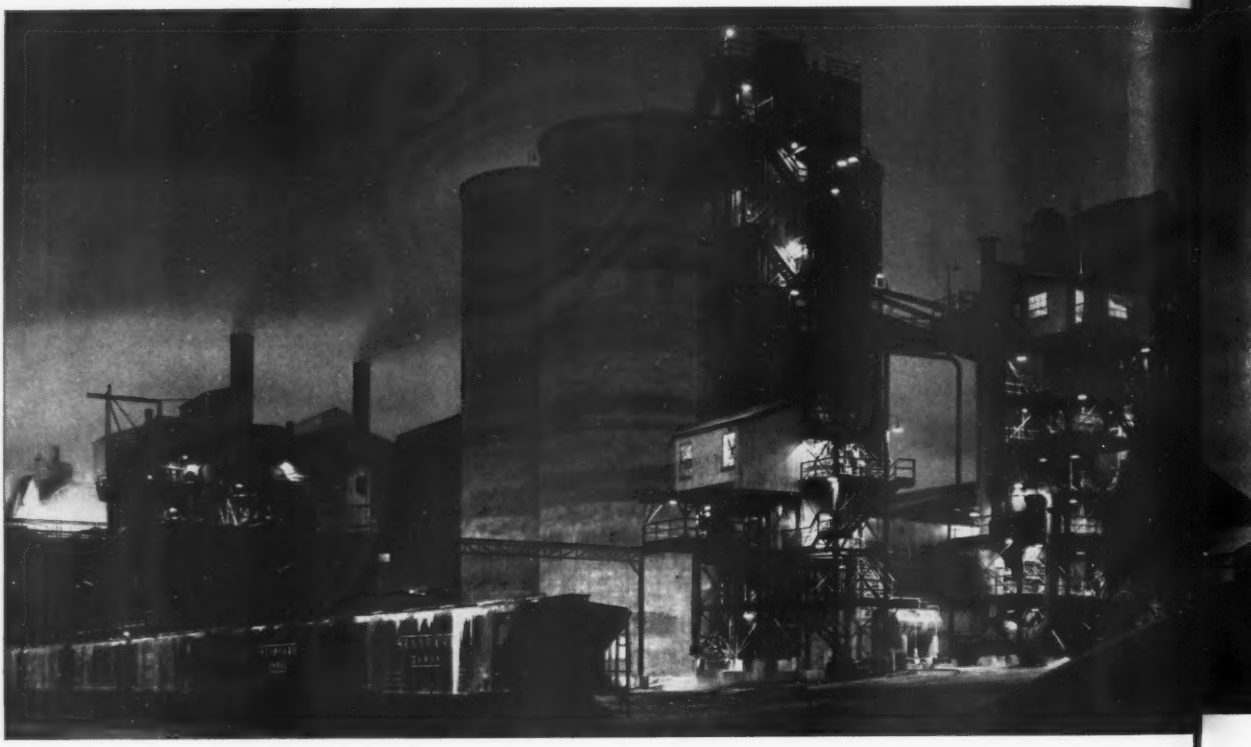
Division of W. R. Grace & Co.

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS.

In just one year...

over ¼ million tons have switched



Round-the-clock production at Bonnie takes the push out of peak-season demands. Mammoth off-season storage capacity swallows up the seven-day-a-week production, stores it safely until you need it. And the industry's finest delivery schedules assure you high-quality triple when you need it.

International's natural curing helps you cut costs

• It's the natural curing process that gives you that "something-extra" quality of the triple super from Bonnie.

It helps you cut costs . . . gives you better control of manufacturing conditions and chemical reactions . . . stabilizes your formulation problems . . . and reduces the delivered unit cost of (P_2O_5). Here's what natural curing means to you:

Uniform particle size . . . for dependable ammoniation results.

Finer texture . . . for more complete ammoniation in every batch.

Stabilized product . . . for better chemical control.

Constant high analysis . . . with guaranteed minimum of 46% A.P.A.

Uniform high quality . . . for increased (P_2O_5) availability.

To guarantee this top quality triple from a plant as large as Bonnie required extra planning in plant design . . . extra capacity for a dependable supply . . . extra time to complete the five-week natural curing process . . . and extra care and quality control to assure uniform results in batch after batch.

This is the way Bonnie was built. And the results of the past year have proved Bonnie can deliver . . . Bonnie is dependable . . . and Bonnie can produce the kind of triple you want.

# of Triple Super Sales to Bonnie

The reason: | *trustworthy service and delivery plus superior results with International's natural-cured triple*

Yes, in a single year, International has zoomed to a top position as a supplier in the triple super industry. Here's why, in the actual words of Bonnie customers:*

Others have recommended you

"Several nitrogen producers have recommended your product to us because of its excellent ammoniation. They were right."

Missouri

You live up to delivery promises

"What we like about doing business with International is your service, particularly regarding delivery. Our material has always been shipped when requested."

Indiana

Your triple stores better

"Last September, we stored some of your triple next to competitive materials from two other suppliers. Six months later, the other two piles were set up hard enough to be blasted. Any lumps in your product could be broken with your fingers."

Minnesota

Your triple is a better product

"This is the best triple we have ever used for ammoniation."

Ontario

We get better ammoniation results

"We can put 600 lbs. of Urana 10 in with 1,400 lbs. of triple."

New York

Your Triple holds more nitrogen

"We have been amazed with the results. With a very high humidity we have been using 500 lbs. of nitrogen solution with 1,400 lbs. of your triple. Never before have we been able to get over 360 lbs. of this solution in the mix."

Maine

We save money with your triple

"We like the constant high analysis of your product. It aids us in formulation and reduces the unit delivered cost."

North Dakota

You meet delivery schedules

"We certainly appreciate the way International came through on schedule during the rush season."

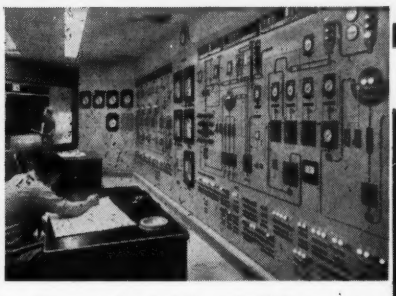
Arkansas

**names on request*

These are just a few of the reasons why this year, the big switch in triple super sales is to Bonnie — giant production facilities . . . prompt delivery . . . superior quality . . . and outstanding ammoniation results.

So this year, for a better product, and service you can depend upon, look to International Minerals & Chemical Corporation. You'll be glad you did.

This 85,000-ton curing unit — as big as two, full-sized football fields — is one example of the time and big capacity needed to produce natural-cured triple.



These "doodads" and dials get results . . . guard the uniformity and quality of every batch of triple super from Bonnie . . . help assure you of top results in ammoniation.

MINERALS International CHEMICALS

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Phosphate Chemicals Division • General Offices: 20 North Wacker Drive, Chicago 6

Spraying Contract For Medfly to U-H

In June United-Heckathorn Co. was awarded a contract to spray some 180,000 acres of Florida's southeastern coast with baited insecticide to kill the Mediterranean fruit fly, USDA reports.

The contract for about $500,000 provides that the acreage will be treated three times. Price does not include the cost of bait attractant, which is to be supplied by USDA and will involve an additional expenditure of another one-half million dollars.

The areas to be sprayed lie between the Everglades on the west and the Atlantic shoreline on the east, and extend to and include the cities of West Palm Beach on the north and Kendall, just south of Miami, on the south. Precise locations at which host plants are known to occur were chosen for treatment after an intensive survey on the ground and from a helicopter. USDA said that not all the area will be covered; many blocks in metropolitan Miami, for instance, and areas covered by water courses or mangrove swamps will not be sprayed.

The contracting firm will supply and mix malathion with water, combining it with a fruit fly-attracting bait supplied by USDA to form a spray.

The Medfly was found in Florida on April 13 for the first time since it was eradicated from the state in 1930. (see FC, May issue, page 66).

On May 19, the spray program was slowed down because of depleted insecticide stocks, according to the Miami, Fla. NEWS.

Wilbur Charles, State Plant Food agent in charge of the pest eradication program, said that the board had let an award for 83,000 pounds of insecticide to Flag Sulphur and Chemical Co. of Tampa.

The Senate Appropriations Committee was reported to have restored $496,000 for full customs inspection of baggage at all ports of entry into the US, making the total amount for inspection service $4,043,200. Some state and federal agricultural experts were said to believe that the Customs Div. spot check policy may have been responsible for letting the medfly into the country.

Davison Wins 5th NSC Honor Award

For the fifth time in six years, Davison Chemical Co. Div. of W. R. Grace & Co. has won on a national basis the award of

Marlin G. Geiger, president of Davison Chemical Co. Div. of W.R. Grace, accepts the award from D. C. Lee, Baltimore Safety Council president.

honor of the National Safety Council.

Davison scored in 1955 a 51 per cent reduction in frequency of accidents and a 77 per cent reduction in severity of accidents from NSC "par" rates.

Norfolk Port Plan

The Norfolk Port Authority is reported studying a major waterfront development program.

Two steps and a possible third are covered in the plan, designed to provide an eight ship waterfront deep-water terminal.

Industry Disagrees On Phos. Rock Limits

Divided opinion has been reported among industry members engaged in mining and processing western phosphate rock deposits on whether limits should be removed on the amount of public phosphate lands a company or individual can have under lease in one state.

Under current legislation, an individual or firm may hold 10,240 acres under lease, but the area that may be leased in one state is limited to 5,120 acres. The subcommittee of the House Interior and Insular Affairs Committee now is considering a bill which would repeal the limit on the amount held within a single state.

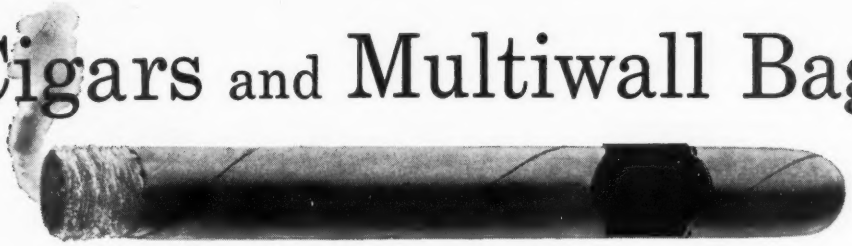
Supporting the bill were said to be representatives of Westvaco Mineral Products Div. of Food Machinery & Chemical Corp., J. R. Simplot Co., the American Mining Congress, Mining Assn. of Montana, Victor Chemical Works and Monsanto Chemical Co.; opposed—San Francisco Chemical Co. and Stauffer Chemical Co.

Stauffer Buys 50% of San Fran. Chem.

Purchase of a 50 per cent interest in San Francisco Chemical Co. from its parent, The Mountain Copper Co., Ltd., of London, England, has been announced by Stauffer Chemical Co. A major western producer of phosphate rock, San Francisco Chemical has for the past several years been Stauffer's primary supplier of this material.

At present, SFC operates its own mine at Montpelier, Ida., mines a Stauffer-owned claim in southwestern Wyoming and has conducted an extensive development program on Stauffer claims and leases near Hot Springs, Ida. Management of the firm will remain unchanged, Stauffer reported.

Cigars and Multiwall Bags



Kraft Bag Corporation, as a manufacturer of multiwall bags, is in the same position as the cigar manufacturer who complained that everything to be said about his 25c cigars had already been said about 5-centers!

...but there is no doubt about the quality of the multiwall bags that bear the Kraft Bag Corporation stamp!

Gilman PAPER CO. • St. Marys Kraft Corp. • Gummed Tape Div. • The Gilbarco Corp. • Kraft Bag Corp.

Our completely integrated plants and modern facilities producing every type of heavy-duty valve or open mouth bag, are second to none!

As an exponent of true specialization, there isn't a single known or desirable time-and-labor-saving development that we haven't already either considered, initiated, adopted or built into multiwall bags we are called upon to make for America's industries, while continuing our search for still better ways to package our customers' products.

If your product can be packaged in a multiwall bag—you can depend on us to make the bag to fit your product.

Investigate ***The KRAFTPACKER®*** *Open Mouth Bag Filling Machine for free-flowing material ... highest accuracy and production ... reduces packaging costs at an unbelievable rate.*

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary

630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.

Plants at St. Marys, Georgia and Gilman, Vermont

Dow Plans New Adm. Center in Midland

Plans to build a new administration center in Midland have been announced by Dow Chemical Co.

In its final form, the center will be a group of buildings in an area almost a half mile long and a quarter mile wide containing headquarters for the entire company.

First unit to be built will be a chemical sales and technical service building, which is expected to be completed late in 1957. Next units are to be an executive office building, heart of the center, and a plastics building.

Asgrow Acquires Kilgore Seed Co.

Acquisition of Kilgore Seed Co., Plant City, Fla., has been approved by stockholders of Associated Seed Growers, Inc., Asgrow reports.

Purchase is based on an exchange of up to 34,650 shares of Associated Seed Growers capital stock at par value of $25 per share, for "more than 80 per cent" of all Kilgore stock at a ratio of three-and-a-half to one.

Shea Expansion Right on Schedule

The $5 million expansion program of Shea Chemical Corp. will be completed on schedule this fall, Vincent H. Shea, president, predicts. The work, begun last August, is about 80 per cent complete and some of the facilities are already in use.

Most important feature of the program, Shea noted, is addition of 140 per cent to the firm's elemental phosphorus producing capacity, enabling the firm to double its production of sodium phosphate and to add a third to phosphoric acid capacity. Shea indicated that these steps would permit a growth in sales from about $10 million expected this year to more than double that figure in 1957.

Stauffer Names Sales Agents

An agreement has been signed by Stauffer Chemical Co. and Corn States Hybrid Service, naming Corn States as service and sales agents of Stauffer's seed protectants, including Captan seed treater, east of the Rockies. Shown above at the signing of the contract are Robert Wolfe, Corn States; J. H. Kennedy, Stauffer; John Spence, Corn States; D. J. Keating, Stauffer.

US Group Invests In Israel Facilities

A $3 million chemical plant, established by Electrochemical Industries (Frutarom) Ltd., has begun operations near Haifa, Israel.

Nearly half of the investment came from a group of American businessmen who, in 1953, formed the American Electrochemical Industries, Inc., of Cleveland, O., to invest in the Israel venture.

Among the insecticides and fungicides produced are BHC, lindane and copper oxychloride. Dusts, wettable powders and emulsions will be formulated.

Nitrogen Div. Issues New 'How to' Film

"How to Use Nitrogen Solutions," a new film just released by Nitrogen Div., Allied Chemical & Dye Corp., is the first on the use of nitrogen solutions for direct application, according to the firm. It tells, in a step-by-step approach, how the solutions are handled, stored and applied.

The 16 mm, sound and color film is aimed at the farmer and is designed to answer his questions about nitrogen solutions.

Companies, farm organizations, clubs, and schools desiring to borrow a print may write to Nitrogen Film Dept., 2nd floor, 205 East 43rd St., New York City 17.

La. Liquid Fert. Co. Opens NH_3 Stations

A new anhydrous ammonia distribution station has been opened by Louisiana Liquid Fertilizer Co. in Bermuda, Natchitoches parish, La., with Robert Helton as manager and B. B. Midyett as territory salesman.

Let the man from Sohio show you how to cut formulation costs

THERE's many a way to skin a cat — solve your formulation problems — *and cut costs* — when you have Sohiogen solutions to back you up.

In many cases, a simple change in materials . . . rate of ammoniation . . . or chemical and physical characteristics can make differences in formulation results and cost of manufacture.

The complete line of Sohiogen nitrogen solutions offers greater flexibility of formulation. No other nitrogen producer offers a more complete line.

What's more, the man from Sohio is trained to help you in your selection. He knows formulation problems. And, he's prepared to work out advantages of shipping and handling . . . or show you ways to use Sohiogen's increased flexibility to greatest cost-cutting advantage.

So call the man from Sohio. He'll be glad to help. And you'll be glad he did.

We're serious about service at Sohio

SOHIO

SOHIO CHEMICAL COMPANY

P. O. BOX 628

FT. AMANDA RD. • LIMA, OHIO

AP&C-Northrop Join in Confab, Recreation

A new development in management-employee relations was inaugurated in the Mojave Desert area when officials of Northrop Aircraft, Inc., Palmdale facility, held a management conference with officers of the American Potash & Chemical Corp. at Trona, Calif., Sunday, May 27, and took with them 1,600 employees in 500 automobiles.

While officials discussed mutual problems, recreation clubs of both companies contested at golf, skeet shooting, archery and swimming contests at Trona, Calif.

The plan has a two-fold value to participating companies, according to Northrop and AP&C officials. It aids the companies' employee relations programs by offering a day of recreation to their personnel, and at the same time, the mutual exchange of ideas between officials is of definite value in solving maintenance, management and other problems.

Cotton Research Need Cited by W. T. Wynn

Cotton farmers should begin thinking about paying from $1 to $1.50 per bale into an industry fund for research and promotion if cotton is to insure its long-range future, said W. T. Wynn in a recent address to the Texas Cottonseed Crushers Association.

Emphasizing that cotton must choose between "research or recession," he pointed out that with an average 12-million-bale crop the collection of from $1 to $1.50 per bale would yield $12 million to $18 million annually for work on cotton and cottonseed problems.

The proposed fund admittedly is but a start, he said, toward matching the money being spent by producers of man-made fibers; but $12 million is enough to get into a really effective program of research and promotion.

V-C Stockholders Meet; Proxy Vote Set for July 18

On July 18, a special meeting of Virginia-Carolina Chemical Corp. stockholders will be held at the Hotel John Marshall in Richmond, Va. according to George G. Osborne, V-C secretary.

Purpose of the meeting, said Osborne, is to give stockholders an opportunity to remove from office any directors they "deem appropriate for the welfare of the company," to elect successor or successors to serve unexpired terms of any directors removed, to consider and act upon three proposals included in the proxy statement and to transact other business which may properly come before the meeting.

Proxies have been solicited by V-C management to be voted for the removal of Rupert T. Zickl as a V-C director and the election of Irving D. Dawes to serve for the unexpired portion of his term.

The three proposals in the proxy statement request the board of directors take appropriate action, to amend the Certification of Incorporation and by-laws of the firm to provide that at all elections of directors, the stockholders shall have the right of cumulative voting, (2) to suspend the stock option plan of 1951 until the arrears on 6 per cent preferred stock outstanding have been eliminated and common stock placed on a dividend basis, and (3) to amend the stock option plan of 1951 if resolution 2 is not carried to provide that any stock acquired under the plan must be held for a minimum of three years.

MRCC Explosion Fatal to Three Workers

In early May, an explosion which occurred at Mississippi River Chemical Co.'s Selma, Mo. plant caused the death of three employees—including Wm. L. Weger, superintendent of the ammonia operation.

Operation of nitric acid and ammonium nitrate facilities, not damaged by the blast was continued, but officials indicated that ammonia production would stop temporarily, pending investigation.

Start of the explosion and flash fire was believed to be in a hydrogen compressor used in anhydrous ammonia production.

Fert. Firm for Burma

Establishment of a joint Japan-Burma fertilizer company in Burma under the Reparations and Economic Cooperation agreement with Japan is reported under consideration by the Japan Ammonium Sulphate Association. Muneki Shiraishi, president of Shin Nihon Fertilizer Co., was to head a mission scheduled to leave for Rangoon early this year to make a survey on the types of plant foods best suited for Burmese soil.

Phillips Petroleum Holds Sales Meet

About 80 Phillips Petroleum Co. fertilizer sales representatives attended a three-day meeting at the Shamrock-Hilton Hotel in Houston, Tex., June 18–20 to hear plans for the firm's 1956–57 fertilizer sales program.

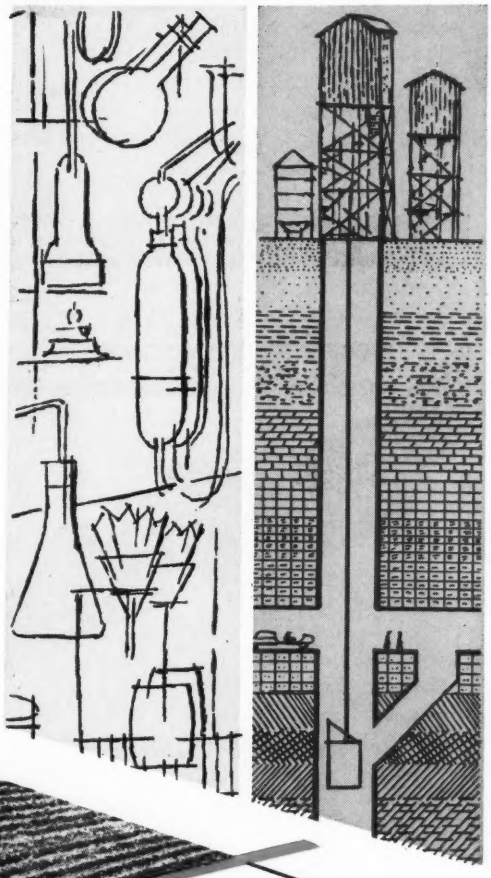
Representing all of the sales divisions in the firm's national marketing area as well as Mexico, the salesmen heard discussions on supply, manufacturing schedules and sales outlook in the industry.

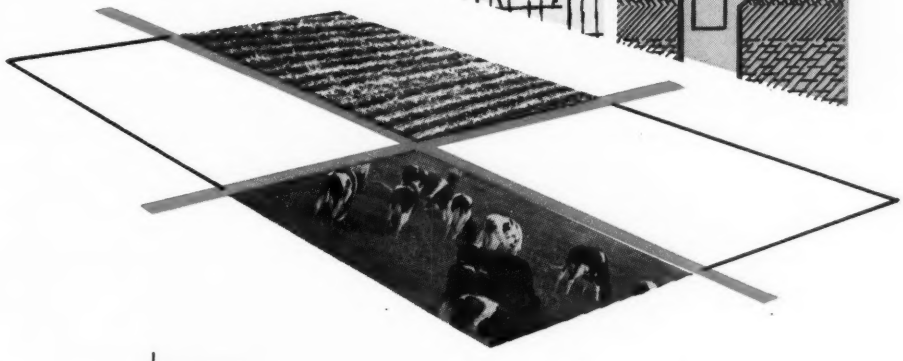
LOOK TO NATIONAL POTASH FOR QUALITY AND SERVICE

Backed by the skills and experience of its parent companies – Pittsburgh Consolidation Coal Company and Freeport Sulphur Company – NATIONAL POTASH offers important advantages as a dependable source of quality potash.

NATIONAL'S mining operations and refining processes will include the very latest industry techniques, and its storage and shipping facilities have been planned to meet efficiently the demand of the peak fertilizer season.

In addition, NATIONAL POTASH provides a free, comprehensive Technical Service to help manufacturers with granulation, formulation and other production problems. Write for complete information.





NATIONAL POTASH COMPANY
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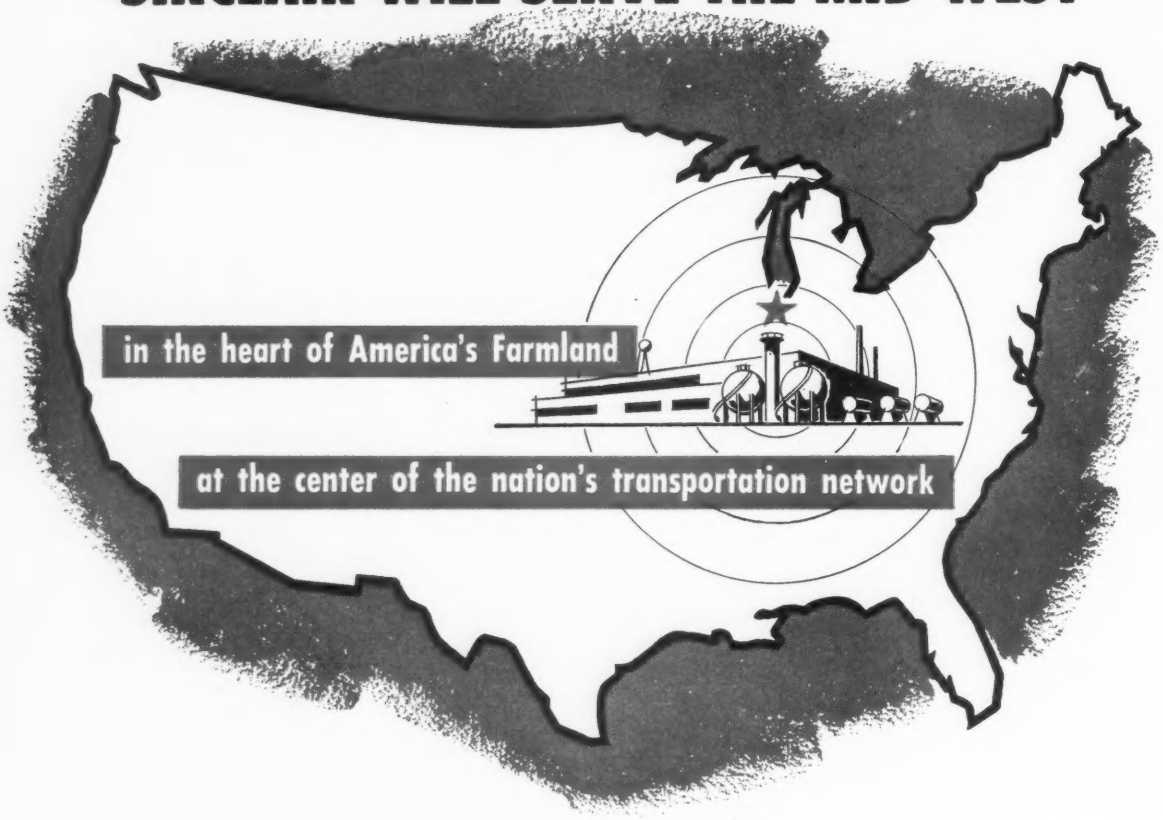
A new source for nitrogen chemicals

SINCLAIR WILL SERVE THE MID-WEST



Strategically located in Hammond, Indiana, this ultra-modern plant will soon be on stream — producing high purity anhydrous ammonia and nitrogen fertilizer solutions for agriculture and industry.

The central location of this plant is of prime importance to you. It means *fast, low cost delivery* of your nitrogen needs via Sinclair's fleet of tank cars and tank trucks. Moreover, vast storage facilities will enable Sinclair to supply you with top quality products during your busiest periods.

For further information about how this new plant can meet your nitrogen supply problems, phone or write . . .

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(Affiliate of Sinclair Refining Company)

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155 North Wacker Drive, Chicago 6, Illinois • Phone Financial 6-5900

Petroleum Chemicals Lets Const. Contract

Petroleum Chemicals, Inc., Lake Charles, La., has awarded a contract for design and construction of a 300-ton-per-day ammonia synthesis plant to Foster Wheeler Corp. The $12 million plant, which will use the Casale ammonia synthesis process, is expected to be completed in the Fall of 1957.

An air separation plant will supply nitrogen for the synthesis and for the liquid nitrogen wash plant, and hydrogen will be produced by low fractional condensation of three hydrogen-rich streams from nearby Cities Service and Conoco refineries.

Simplot Resumes Phosphate Mining

Mining activities have been resumed at the Simplot Gay Mine, Pocatello, Ida., supplying ore for Fertilizer Div. phosphates.

Removal of overburden to open two new pits is proceeding with speed, the firm reports, using two Euclid 30-ton scrapers and tractors. When the phosphoria has been exposed, mining will proceed as usual.

Olin Math. Completes Synth. Gas Exp. Unit

Olin Mathieson Chemical Corp.'s new experimental unit for the production of synthesis gas by partial oxidation of coal at Morgantown, W. Va., was ready for operation early last month, M. B. Wright, manager of the Morgantown plant, reports.

Although it will be used for experimental purposes only, the unit is capable of producing synthesis gas sufficient to manufacture about 80 tons a day of ammonia or equivalent methanol.

"It is expected that the partial oxidation process will eventually replace the present process for making synthesis gas at Morgantown," Wright said, "and that this will strengthen the plant's competitive position relative to newer plants using natural gas or petroleum as raw material."

AP&C Plant Honored For Accident-Free '55

American Potash & Chemical Corp.'s Los Angeles plant has received an award from the National Safety Council for an accident-free record during 1955.

Presented at a Business and Industrial Safety Contest dinner at Los Angeles' Ambassador Hotel, the award is the eleventh received by AP&C and its divisions during 1955–56.

Pennsalt Installs New Salt Cells at Portland

Sodium chlorate cells at Pennsylvania Salt Manufacturing Co.'s Portland, Ore., plant will be replaced immediately, officials of the firm have announced. Utilizing an improved electrolytic cell developed by Pennsalt technical and operating personnel, the new facilities are expected to go on stream early next year.

African Fertilizer Firm Plans Expansion

An $8 million expansion program has been announced for the only fertilizer firm in the Federation of Rhodesia and Nyasaland, It is expected that after completion of the plant, scheduled for 1958, the federation will be independent of imported plant foods.

Census of Mfrs. Prelim. Report Issued

Thirty-one thousand employees in the fertilizer industry earned $107 million in 1954, according to the 1954 Manufactures Census preliminary report. Of these, 24,000 were production workers who earned $75 million in 52 million manhours. Value added by manufacture (which approximates the income created in this industry) was $234 million in 1954, compared with $187 million in 1947.

In the insecticide and fungicide industry, total payroll was $25 million to 6,000 persons, of which 4,000 were production workers who earned $13 million in 8 million manhours. Value of shipments in 1954 was $169 million and cost of materials, supplies, fuels, electric energy and contract work was $109 million, making value added by manufacture $60 million. This compares with $25 million in 1947.

Plant food industry new capital expenditures totalled $45 million, and insecticide and fungicide, $3 million. The figures do not include expenditures for "used" plant and equipment and expenditures for land.

For all industries, value added by manufacture totalled $116 billion in 1954, a 5 per cent drop from the 1953 estimate compiled in the 1953 Annual Survey of Manufactures and a 56 per cent rise in dollar value over 1947 when the last complete Census of Manufactures was taken. Manufacturing employment during 1954 declined 6 per cent from 1953 levels to total 16.1 million employees, but was 13 per cent over 1947. Similarly, the report states, manufacturing payrolls totalled $66 billion in 1954, a 4 per cent decrease from 1953, but 67 per cent over 1947.

THIS YEAR

For Complete Cotton Insect Control Include the "Old Stand-bys"

PENCO® PENCAL® (LOW-LIME CALCIUM ARSENATE)

AND

PENCO Calcium Arsenate

Other PENCO Cotton Insecticides include formulations of:

BHC-DDT • TOXAPHENE
ALDRIN • DIELDRIN
ENDRIN • PARATHION

Made in the South . . . for the South

PENCO PENCAL (low-lime Calcium Arsenate)

- Compatible with BHC-DDT-PARATHION-MALATHION
- Time proven
- At regular Calcium Arsenate price

PENCO Calcium Arsenate

- Reliable
- Now in new favor
- An old-time favorite

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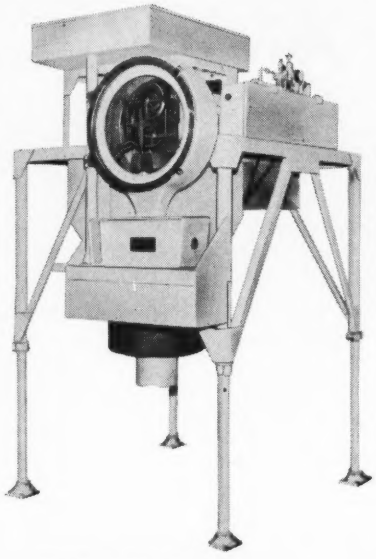
Pennsalt Chemicals

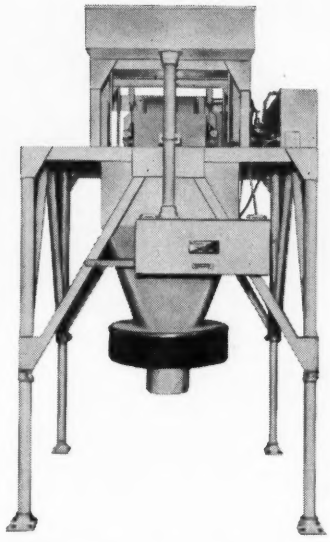
When your trade demands 50's

keep your packaging costs down

with the UNION I&C BAGGER



MODEL UB 101 (Dial Scale)
for finer weight tolerances and visible weight check



MODEL UB 100-A (Double Beam Scale)
for accurate, high speed weighing of granular materials

If you are faced with the necessity of packaging in 50-lb. units, the Union I & C Bagger can help you eliminate the increased packaging expenses you would otherwise face.

The Union Bagger easily handles up to twenty 50-lb. bags a minute. You can convert from 100-lb. containers and still maintain your net tonnage per hour.

Over 300 Union Baggers have been installed by fertilizer manufacturers in the past two years alone. The savings you make with this automatic and practically fool-proof high speed equipment not only improve your competitive position, but your savings alone actually pay the full cost of the Bagger in a remarkably short period of time.

We will be glad to demonstrate with actual figures based on recent fertilizer installations.

Ends "rush season" production worries, brings about greatest savings, fertilizer executives report

SOLVES RUSH SEASON SHIPPING PROBLEMS

"Your UB-101 machine has proved to be more than adequate in every phase of performance."

P. L. Etheredge, Secretary-Treasurer Etheredge Guano Company, Inc., Augusta, Ga.

ELIMINATES ALL OVERTIME

"We were able to eliminate all overtime during the past two seasons, which I am convinced more than compensated us for the small cost of the baggers.

"The speed and accuracy of these units made the many thousands of tons we handled during the rush period a pleasure.

"One of the most significant features is the lack of maintenance. The amount we have expended would not exceed $25 for the past two years."

C. P. Belding, Supt., F. S. Royster Guano Company, Athens, Ga.

PRODUCTION UP 50%—LABOR SAVINGS 33%

"The Union I & C Bagger has enabled us to increase production to 50 to 60 tons per hour, compared with 35 to 40 tons in the past, and we are able to do it with two men instead of three. The Union Bagger is as fast and efficient a bagger as I've ever encountered. Its performance has been little short of sensational."

C. L. Durham, Plant Superintendent Dixie Guano Co., Laurinburg, N. C.

UNION I&C BAGGER

Automatic Weighing and Filling Machine for Open Mouth Bags

Manufactured by INGLETT & CORLEY, INC., AUGUSTA, GA.
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NEW! SEND FOR UNION'S AUTHORITATIVE AND PRACTICAL "FERTILIZER PACKAGING WORK KIT"

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Please send immediately your new "Fertilizer Packaging Work Kit" which includes a new calculator for figuring our bagging cost-per-ton. I understand there is no charge or obligation.

Name.....Title.....

Company.....

Address.....

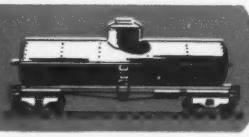
City.....Zone.....State.....

5 PHILLIPS Fertilizer Materials for High Analysis Mixtures

1 Ammonium Sulfate

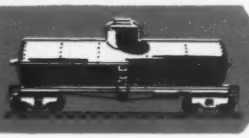
New Premium Quality Phillips *66* Ammonium Sulfate contains 21% nitrogen, 23.8% sulfur. It is *dry*-cured to remove excess moisture, prevent caking. Uniform dust-free crystals flow freely, mix easily. Ideal for all analyses of mixed goods and for direct application. Available in bags or bulk.

2 Anhydrous Ammonia



Phillips *66* Agricultural Ammonia contains 82% nitrogen. It's a convenient, economical source of nitrogen for mixed goods formulation. Tank car shipments are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle and at Houston, Texas.

3 Nitrogen Solutions

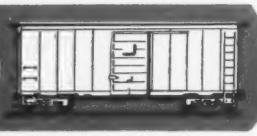


Get more N per dollar! There are three Phillips *66* Nitrogen Solutions for use in preparation of high-analysis fertilizers and the ammoniation of superphosphate. These solutions keep manufacturing costs low; help rapid, thorough curing.

4 Ammonium Nitrate

Phillips *66* Prilled Ammonium Nitrate contains 33.5% nitrogen. The small, coated prills resist caking, handle easily. Depend on Phillips *66* Prilled Ammonium Nitrate for free-flowing uniform properties and top-notch crop response as a direct application material. It's an ideal companion high nitrogen fertilizer for quality mixed goods.

5 Triple Superphosphate



Phillips *66* Triple Superphosphate contains 46% available phosphoric acid. Ideal for use in formulation of high-analysis fertilizers.

PHILLIPS CHEMICAL COMPANY

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Phillips 66

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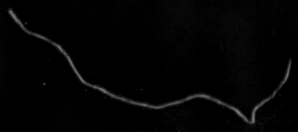
CHICAGO, ILL.—*7 South Dearborn St.*
DENVER, COLO.—*1375 Kearney Ave.*
DES MOINES, IOWA—*606 Hubbell Bldg.*
HOUSTON, TEX.—*1020 E. Holcombe Blvd.*
INDIANAPOLIS, IND.—*1112 N. Pennsylvania St.*
KANSAS CITY, MO.—*500 West 39th St.*
MINNEAPOLIS, MINN.—*212 Sixth St. South*
NEW YORK, N. Y.—*80 Broadway*
OMAHA, NEB.—*WOW Building*
PASADENA, CALIF.—*604 Citizens Bank Bldg.*
RALEIGH, N. C.—*804 St. Mary's Ave.*
SALT LAKE CITY, UTAH—*68 South Main*
SPOKANE, WASH.—*521 E. Sprague Ave.*
ST. LOUIS, MO.—*4251 Lindell Blvd.*
TAMPA, FLA.—*1214 South Dale Mabry*
TULSA, OKLA.—*1708 Utica Square*
WICHITA, KAN.—*501 KFH Building*



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OUR IMPROVED

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Muriate of Potash?

• HIGH ANALYSIS
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DUVAL SULPHUR and POTASH CO.

Modern Plant and Refinery at Carlsbad, New Mexico

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New Blue Valley Granulators

Blue Valley Equipment Manufacturing & Engineering Co. has announced installation of four new granulating units, bringing to 27 the number installed in this country and Canada.

The Deep Root Fertilizer Co. plant in Olathe, Kans., designed and engineered by Blue Valley.

Single units recently were installed for Robert A. Reichard Co., Dorchester Fertilizer Co. and Deep Root Fertilizer Co., and a double-capacity unit for G. L. F. Soil Building Service.

The Deep Root plant at Olathe, Kans., was designed and engineered by Blue Valley.

A new customer service program has been established by the firm. On-the-job starting of granulating units and training of personnel in granulating techniques has now been made available to Blue Valley customers, without any additional cost.

Truesdail Labs., Inc. Creates Scholarship

A $1,000 annual scholarship has been created by Truesdail Laboratories, Inc. The Truesdail Chemistry Scholarship, established at the University of Redlands, will enable an outstanding sophomore student in chemistry to continue study for his junior year.

Two basic purposes in creating the scholarship, said Dr. Roger Truesdail, president, were to highlight the needs of independent colleges at this time and to contribute toward relief of the current shortage of trained scientific personnel.

Davison Installs Granulation Units

Facilities have been installed at three Davison Chemical Co. plants—Alliance, O., Perry, Iowa, and Curtis Bay, Md.—for production of an improved type of granulated fertilizer, the firm has announced.

The process is characterized by positive heat control and use of ingredients in solution form. In addition, it enables production of higher analysis fertilizers, up to the 15-15-15 range.

Coastal Chemical To Begin Stock Sale

Coastal Chemical Corp. stock will be offered for sale to farmers and others engaged in output of agricultural products, following registration of the $7,250,000 stock issue with the Securities and Exchange Commission.

Plans for the sales campaign are being formulated under the direction of Owen Cooper, executive vice president of both Mississippi Chemical and Coastal Chemical Corps. Sale of the stock will be handled by the field representatives of Mississippi Chemical Corp., with whom Coastal Chemical has a management contract and also an underwriting contract for sale of stock.

Site for the new plant, which will produce high analysis fertilizers, superphosphate and triple superphosphate, is Pascagoula, Miss.

OM Predicts 115% Sales Increase by '60

Olin Mathieson Chemical Corp.'s sales volume could climb to $1.2 billion in 1960, 115 per cent higher than 1955 totals, and pre-tax profits could reach $229 million, up 179 per cent from 1955, John W. Hanes, chairman of the corporation's Finance Committee, predicted in a recent speech before the National Federation of Financial Analysts.

New Incorporation

Terraco, Inc., fertilizer and by-products, has been granted charter of incorporation listing capital stock of 200 shares, no par value. Directors are Bernard R. Jankoff, Stanley J. Dorman and Josephine Nocers, all of 521 Fifth Avenue, New York City 17.

Ninol Moves Chicago Res. & Devel. Facilities

Research and development laboratories of Ninol Laboratories have been transferred to the new plant on the south side of the city, and business and executive offices are being moved to larger quarters in the Prudential Plaza, Chicago 1.

Calspray Establishes Haddonfield Office

California Spray-Chemical Corp. has moved its Northeast Atlantic district office from Linden, N. J. to 133 Kings Highway East, Haddonfield, N. J. Phone: Haddonfield 9–7181.

YOU INCREASE PROFITS WHEN YOU USE

TRIANGLE BRAND COPPER SULPHATE

IN YOUR FUNGICIDE AND FERTILIZER FORMULATIONS

Since 1885, successful growers have preferred Triangle Brand Copper Sulphate in fungicides. It has consistently proved itself more effective and superior to organic materials; in sprays, where Bordeaux Mixture is the most reliable, or in dusts, if preferred.

In mixtures and emulsions, it is compatible with virtually every other pesticidal material. In fertilizers, it is important for enrichment of the soil and its use guarantees larger, healthier and more profitable crops. Forms of Triangle Brand Copper Sulphate available are:

INSTANT (powder) for quick and efficient mixing of Bordeaux sprays.

DIAMOND (snow) small or large crystals, all containing 25.2% metallic copper.

BASIC Copper Sulphate in powder form, containing 53% metallic copper.

Contact us today for further information on TRIANGLE BRAND COPPER SULPHATE and its use in your agricultural formulations.

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NEW YORK, N.Y.

Totman Reports on No. Chem. Progress

Northern Chemical Industries new contact sulfuric acid plant has increased rated capacity at Searsport, Me. to 170 tons per day, with actual production reaching 245 tons, J. E. Totman, president, said last month in a progress report.

Nitric acid, ammonium nitrate and nitrogen solution facilities have been turned over, he reported, and final adjustments are now being made. The anhydrous ammonia line was nearing completion, and start-up of the first segment was scheduled for late June. Following closely behind will come the Texaco process unit, then shift conversion and nitrogen purification units. If no undue difficulty is encountered, the units are expected to be in maximum production within 60 days.

NCI now has part of its tank car fleet. Some cars are all-steel, others aluminum and some rubber-lined steel tank cars.

An additional land purchase now gives the firm a total of 220 acres with about half a mile frontage along the B & A Railroad.

Dow, Mich. U. Research Project

A basic research project in insect taxonomy has begun under the joint sponsorship of the University of Michigan and Dow Chemical Co., according to Dr. R. H. Boundy, Dow vice president and director of research.

The University has provided lab space and general facilities and Dow the funds for the research. Project director is Dr. Henry Townes, who has joined the University staff as a research associate. Robert R. Dreisbach, Dow consultant, will work with Dr. Townes.

The project is specifically designed for the preparation of taxonomic monographs on United States parasitic wasps.

Robert R. Dreisbach, Dow Chemical Co. consultant, and Dr. Henry Townes are key figures in a basic research project in insect taxonomy sponsored jointly by Dow and the Univ. of Mich. Dr. Townes is project director.

Motomco Moves To Clark, New Jersey

Motomco, Inc., has moved into a new building housing plant and offices on Terminal Ave., Clark, N. J.

Located about 16 miles from downtown New York City, the building provides new and enlarged office space and complete manufacturing and laboratory facilities.

Int. Min. & Chem. Dividend Declared

International Minerals & Chemical Corp.'s board of directors has declared the regular quarterly dividend of $1 per share on the 4 per cent cumulative preferred stock of the firm and a quarterly dividend of 40 cents a share on common stock, both payable June 30 to stockholders of record June 15.

Can. Plant Addition For Amino Triazole

Construction of extensive facilities for the production of amino triazole has been started by North American Cyanamid Co., Ltd. at the firm's Welland plant, Stamford Township, Niagara Falls, Ontario.

The addition is expected to triple production capacity for the chemical by 1957.

Fairfield Chemical Change of Address

Fairfield Chemical Div. of Food Machinery & Chemical Corp. has moved its New York sales office from 420 Lexington Ave. to 441 Lexington Ave., Zone 17. New phone number is OXford 7-1940. The office is directed by John F. Odeneal.

PEOPLE

American Agricultural Chemical Co. H. L. Martin, Jr., former division superintendent responsible for Western Div. production, has been named general superintendent of maintenance, exclusive of the phosphate rock mines.

American Potash & Chemical Corp. Ralph Vreeland has been named plant process engineer at the Los Angeles plant. In his new capacity, he is in charge of process control and development of existing products.

Carbide and Carbon Chemicals Co. Dr. G. H. Law recently was appointed vice president—research, and H. M. West, manager—textile fibers.

Commercial Solvents Corp. Hans M. F. Fischer succeeds Thomas Potter as assistant to W. Ward Jackson, vice president in charge of the company's Petrochemicals Div. Since joining CSC in 1933 as a member of the Terre Haute, Ind., production staff, his work has included research engineering, management of the Terre Haute, Ind., plant, and most recently, he was assistant to the general manager of the company's Petrochemicals Production Dept.

Fisher

Wilbur L. Keko has been named superintendent of the CSC Peoria, Ill., plant. Previously superintendent of aerobic fermentation and pharmaceuticals production at the Terre Haute, Ind., plant, Keko has been with the company since 1938.

Coronet Phosphate Co. B. J. Phillips is named sales representa-

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

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FERTILIZER MANUFACTURERS:

NEW SUPERIOR GRANULAR TRIPLE SUPERPHOSPHATE FOR DIRECT APPLICATION IS NOW AVAILABLE FROM U. S. PHOSPHORIC PRODUCTS. GUARANTEED 46% A. P. A.

In addition, run-of-pile Triple Superphosphate for maximum ammoniation and coarse material for mixing purposes continue to be available for immediate shipment against your orders. Contact your nearest Bradley & Baker Sales Office for details.

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District Sales Offices:
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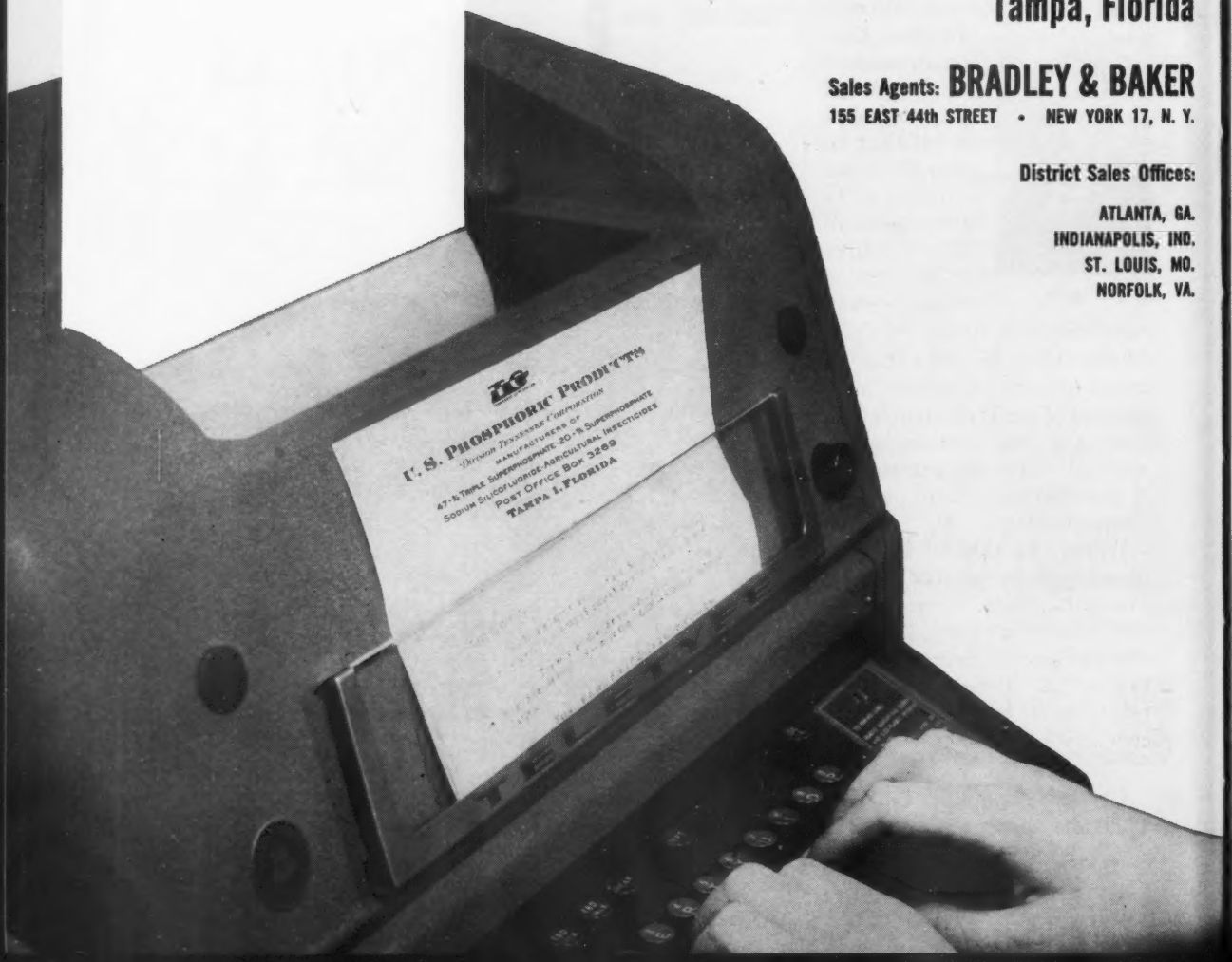

tive for the firm's CDP southeastern sales territory.

Crowley Tar Products, Inc. Election of William J. Jennings as executive vice president recently was announced.

Escambia Bay Chemical Corp. Robert U. Haslanger has been appointed president of the firm, succeeding Kenneth G. Donald who has resigned to devote his full time to his duties as vice president and treasurer of National Research Corporation. Newly named vice president is N. C. Robertson, director of research.

Haslanger

At the annual stockholders meeting on May 22, the following men were elected to the board of directors:

Robertson

N. C. McGowen, chairman of the board and president, Ed Parks, executive vice president, United Gas Corp.; George G. Walker, president, and A. A. Talmage, vice president, Electric Bond and Share Co.; R. S. Morse, president, and K. G. Donald, vice president, National Research Corp.; R. U. Haslanger; and Saunders Gregg, United Gas Corp.

Appointment of A. N. Wohlwend as director of commercial development for Escambia Bay was announced by Haslanger.

Food Machinery & Chemical Corp. S. Philip Marcus will be business manager of the Chemical Division's central research laboratory now under construction. Dr. J. A. Robertson has been appointed supervisor of chemical microscopy at the lab. Dr. O. C. Karkalits becomes process and economic appraisal supervisor, John E. Zarembo, supervisor of general analytical services, and John P. Alden, technical information service supervisor. Long range research programs will be carried out at the Princeton, N. J., center for the benefit of all six operating divisions.

Federal Chemical Co. D. T. Morris becomes assistant sales director of Federal Chem. Morris joined the firm in 1941 as a salesman in middle Tennessee, and since 1950 has been assistant sales manager of the firm's Nashville Div.

Morris

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LONDON ALLENTOWN, PENNA. BOSTON

. . . People

W. R. Grace & Co. The Polymer Chemicals Div. has named Anthony J. Bruno, Jr. as technical department head of its multi-million dollar GREX polyolefin resin plant now under construction at Baton Rouge, La. Bruno had been chief engineer for Escambia Bay Chemical Corp. in Pensacola, Fla.

Hydrocarbon Products Co. Directors of the firm have announced election of William Reed Morgan as vice president in charge of sales. Formerly he was midwest sales manager for International Mineral & Chemical Corp.'s Potash Div.

Morgan

Michigan Chemical Corp. John A. Holderreid has joined the firm's research staff. He had been with Liberty Powder Defense Corp. as a chemist. His appointment to MCC is part of the current expansion of the company's development program, according to Dr. Dwight Williams, director of research.

Northern Chemical Industries. Donald T. Fangmeyer, former manager of Wholesale Sales with Olin Mathieson Chemical Corp.'s Eastern Fertilizer Div., has been named NCI general sales manager.

Olin Mathieson Chemical Corp., Industrial Chemicals Division. Sales management responsibilities have been realigned and the following appointments announced: Kenneth C. Frazier, manager, general products sales department; Derek Richardson, manager, and O. J. Theobald, Jr., assistant manager, field sales activities; Laurence E. Russell, manager of a newly established sales development department; and Cecil L. Williamson, manager, administrative services department.

Pennsylvania Salt Mfg. Co. of Wash. New technical supervisor for the Southern Div. is Edwin J. Pinigis, according to an announcement by A. F. Bixby, agricultural chemicals manager. A 1950 chemistry graduate of the University of Pittsburgh, Pinigis formerly served with Pittsburgh Coke & Chemical and American Potash & Chemical Corp. He will establish his office at Southern Div. headquarters, Bryan, Tex.

Pinigis

Spencer Chemical Co. Robert W. Hardcopf joins the Agricultural Chemicals Market Research Dept. as a junior market analyst, filling a vacancy created when researcher Robert Farrow became Ohio agricultural sales representative for Spencer.

Hardcopf

Hardcopf received a Bachelor's Degree in Forestry from Iowa State in 1951 and is currently completing work on a Master's Degree in Agricultural Economics at the college.

Stauffer Chemical Company. E. Wm. Eipper has been appointed director of the market development department, according to an announcement by Dr. C. L. Arnold, vice president in charge of research and development. A graduate of Stanford University, Eipper joined Stauffer in 1954 as western manager of market development.

Eipper

Stauffer also announced appointment of HermanBehme as eastern manager of the market development department.

H. Leroy Thompson, recently manager of chemical research and development, Southern Natural Gas Co., has established his office as consulting chemical engineer at 329 Brown-Marx Bldg., Birmingham 3, Ala.

Thompson-Hayward Chemical Co. William E. Swart has been named manager of the Lubbock, Tex., branch.

United States Potash Co. John E. Fletcher has been named sales manager. Since joining the firm in 1949 he has been sales representative in the southeastern territory and midwestern territory and was named assistant sales manager last year.

Velsicol Chemical Corp. Promotion of F. E. Richardson from assistant plant manager to plant manager of the Memphis plant recently was announced. Richardson went to Velsicol in 1948 with a background of 12 years of varied engineering experience. At one time, he was chief engineer at the Memphis plant in charge of expansion design and construction projects.

Richardson

Wyandotte Chemicals Corp. Dr. J. William Zabor has been named director of research.

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Continuous Lion advertising appears in leading farm publications, month-after-month, to pre-sell the Lion brand to farmers—and to sell the value of *your mixed fertilizers as well!*

Current advertisements are appearing in Farm and Ranch-Southern Agriculturist, Progressive Farmer, The Farmer, Nebraska Farmer, Kansas Farmer, Prairie Farmer, Wallace's Farmer & Iowa Homestead, Wisconsin Agriculturist and Farmer, Missouri Ruralist and Missouri Farmer. All of these advertisements are in color.

Each Lion advertisement promotes the economic benefits of properly using fertilizers, including Lion Ammonium Nitrate, to help increase the farmer's profits. Each advertisement sells *hard* on the importance of soil tests in the intelligent use of all commercial fertilizers. Lion, a leader in nitrogen production, leads the way to good fertilization practices . . . to better profits for you!

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Associations & Meetings

NAC September Meeting Scheduled

The National Agricultural Chemicals Association will hold its 23rd annual meeting in The Essex and Sussex, Spring Lake, N. J., on Sept. 5, 6 and 7, L. S. Hitchner, NAC executive secretary, reports.

Program committee chairman is Dr. Alfred Weed, John Powell & Co., Div. of Olin Mathieson Chemical Corp.

CFA Essay Contest Winner Announced

Richard Davies, a vo-ag student at Fullerton Junior College, has been chosen for the $100 cash Grant Award in the California Fertilizer Essay Contest, sponsored by the Soil Improvement Committee, California Fertilizer Association. Prizes of $25 in cash will go to author of the best essay submitted from each of the other eight participating schools. Subject of the contest was "Use of Fertilizer on Pasture and Rangeland."

ASFFCO Holds 14th Annual Meet

The Association of Southern Feed and Fertilizer Control Officials met at the Hotel Roanoke, Roanoke, Va., June 28–30 for its 14th annual convention.

On the program were addresses by Russell Coleman, National Plant Food Council executive vice president; John D. Conner, Sellers & Conner; Parke C. Brinkley, commissioner of agriculture, Richmond, Va.; L. Y. Ballentine, commissioner of agriculture, Raleigh, N. C.; and H. L. Dunton, head, Agronomy Dept., Va. Polytechnic Institute. Also scheduled was a panel discussion by J. F. Fudge, L. C. Jacobs, Bruce Cloaninger, C. E. Floyd, S. F. Thornton and V. Sauchelli of topics and questions submitted.

NPFI Award to N.C. Student

The National Plant Food Institute annually sponsors in fourteen states "Agronomy Achievement Awards" for young men majoring in either crops or soils who have exhibited unusual leadership potentialities and who have notable scholastic records. North Carolina State College Student Agronomy Club is the latest to be honored by NPFI. Above, Dr. N. C. Folks, faculty advisor; Tully Baxter Williams, winner of the achievement award; and Dr. Willard H. Garman, NPFI chief agronomist, who presented the award.

Panel Highlights WACA Spring Meet

The Western Agricultural Chemicals Association spring meeting in the Hotel Clark, Los Angeles, May 15, attracted an attendance of 130 persons who heard a panel of scientists from the University of California's College of Agriculture discuss "The Experimental Status of New Pesticides." Here are the answers each panel member gave when asked by C. O. Barnard, WACA executive secretary, what he considered to be the highlight of his contribution.

Dr. W. W. Jones, horticulturist, Citrus Experiment Station. "Urea low in biuret can be used to supply the nitrogen requirements of citrus trees. Iron chelates are in the experimental stage. The isopropyl ester of 2,4-D is recommended for use on citrus."

Dr. J. B. Kendrick, Jr., plant pathologist, Citrus Experiment Station, on Chemotherapy versus Systemics. "Chemotherapy implies treatment of plants already infected, in an effort to eradicate a disease. The action takes place inside a plant and may or may not act at the site of application. Chemical fungi toxicants which translocate inside a plant are regarded as systemic—thus chemo therapeutant-type chemicals are not necessarily systemic chemicals. Rather, the systemics may be a special type of chemo therapeutant. When a systemic chemical is one which protects a plant against infection, it is not generally considered to be a chemo therapeutant."

Dr. William Moje, assistant chemist, Citrus Experiment Station. "Instead of haphazardly screening chemical compounds for nematode, fungi and bacterial controls, we are now in a position to select soil fumigants on the basis that toxicity is primarily a function of reactivity."

Dr. Boysie E. Day, assistant

WACA Meet, Cont'd.

plant physiologist, Citrus Experiment Station, stressed that recommendations in the use of herbicides are becoming more specific.

Probably the best solution to most effective crop protection will be the specificity of a pesticide against each crop pest, stated J. Ed. Swift, extension entomologist.

Speaking on development of new insecticides, Dr. R. L. Metcalf, entomologist and chairman, Dept. of Entomology, Citrus Exp. Station, said that organic phosphorus esters outnumber other experimental insecticides currently under development three to one. Their successful commercial development will depend upon optimum combinations of such factors as low cost, favorable ratio of mammalian toxicity to insect toxicity, degree of residual activity, systemic action and selective toxicity to insects.

Mfg. Chemists' Assn. Elects New Officers

At the 84th annual meeting of the Manufacturing Chemists' Association, held in June, John L. Gillis, vice president of Monsanto Chemical Co., was elected chairman of the MCA board.

Kenneth C. Towe, president of American Cyanamid Co., was elected chairman of the executive committee and Leland I. Doan, president of The Dow Chemical Co., and R. C. McCurdy, president of Shell Chemical Corp., were elected MCA vice presidents.

New Group to Give Public Insect Info

A non-profit, public service organization named the Home Insect Control Bureau has been formed at Kansas City, Mo., according to Dr. Harlan R. Shuyler, executive director.

The bureau will devote itself to educating the American public on the various household insects.

Calendar

July 12. Annual S. C. Fertilizer meeting and tour, Edisto Exp. Sta., Blackville, S. C.

July 19-20. Southwestern Fertilizer Conference and Grade Hearing, Buccaneer Hotel, Galveston, Tex.

July 25-27. NW Assn. of Horticulturists. Entomologists & Plant Pathologists Conf., Northwest Wash. Experiment Sta., Mt. Vernon, Wash.

Aug. 1. Annual Kentucky Fertilizer Conference, Guignol Theatre, Univ. of Kentucky, Lexington, Ky.

Aug. 2-3. Nitrogen Field Day and Equipt. Demonstration, Ohio State Univ., Columbus.

Aug. 14-15. Ohio Pesticide Institute, summer meeting, Ohio Agr. Expt. Station, Wooster.

Aug. 17-25. Tenth International Congress of Entomology, McGill University & Univ. of Montreal, Montreal, Canada.

Aug. 22-24. Beltwide Cotton Mechanization Conf., Atlanta Biltmore, Atlanta, Ga. (Sponsored by National Cotton Council.)

Aug. 30. S. C. Plant Food Educational Society Fall Convention, Clemson House, Clemson, S. C.

Sept. 5-7. Nat'l. Agricultural Chemicals Assn. 23rd annual meeting, Essex and Sussex, Spring Lake, N. J.

Oct. 15. Fifth annual chemical sales clinic sponsored by Salesmen's Assn. of the American Chemical Industry, Hotel Commodore, New York City.

Oct. 16-17. National Nitrogen Solutions Assn. annual meeting and trade show, City Auditorium, Sioux City, Iowa.

Oct. 18-19. Assn. of American Fert. Control Officials meeting, Shoreham Hotel, Washington, D. C.

Oct. 23-24. Pacific N. W. Garden Supply Trade Show, Shrine Auditorium, Portland, Ore.

Oct. 22-26. 44th National Safety Congress and Exposition, sessions in Conrad Hilton, Congress, Morrison and La Salle Hotels, Chicago.

Now available—the New Fifth Edition . . .

INSECT PESTS OF FARM, GARDEN, AND ORCHARD

By the late LEONARD MARION PEAIRS, formerly of West Virginia University, and RALPH HOWARD DAVIDSON, Ohio State University. The fifth edition of this widely used reference has been almost completely rewritten to take into account the revolutionary changes that have occurred in the science of insect control during the past decade. The work emphasizes the essentials of insect morphology, physiology, and development. It includes information on the place of insects in the animal kingdom; tells how insects are classified; outlines the principal orders and families of insects; and thoroughly treats all the major pest species, stressing distribution, common hosts, life stages and cycles, and kind of damage done.

Since the importance of many pests has increased, the authors have enlarged their chapters on pest control. Many new phases are treated, with major emphasis on chemical control. The actions of new insecticides are fully explained, as are their availability, cost, toxicity, and residual action. Information on insecticide formulations, application equipment, dilution tables, compatibility, and other pertinent data has been assembled into a new chapter.

1956. 661 pages. $8.50.

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VIEWING WASHINGTON

with Farm Chemicals Washington Bureau

on agriculture

The $1.2 billion Soil Bank program now is under way across the land on a limited basis. The two-part program—Acreage Reserve and Conservation Reserve—is late in getting under way and is not expected to attract many farmers. Most likely candidates are those whose crops look poor, or those who had purposely idled land this spring in anticipation of the program.

Here are significant details of the regulations governing 1956 Soil Bank operation:

The Acreage Reserve pays farmers a pretty fair rate for underplanting allotments of corn, cotton, wheat, rice, peanuts and tobacco. Farmers can either underplant, or plow up acreage to get into the program. They also can get pay if their crop fails due to natural causes such as drought or flood. Rates of payment are 90 cents a bushel for corn, $1.20 for wheat, $2.25 a hundredweight for rice, 3 cents a pound for peanuts, and from 9 cents to 18 cents a pound for various types of tobacco.

USDA has established final dates by which farmers can plow up land to become eligible for the Acreage Reserve. These dates coincide with the dates established for bringing allotments into compliance with the acre-allotment program. No plow-ups will be permitted after July 31.

Payments will be made on the basis of multiplying the applicable yield-per-acre factor by the crop payment rate. For underplanting the corn base or allotments for cotton, rice, tobacco, peanuts or spring wheat, the payment rate is based on the normal yield for the designated acreage. For under-planting 1956 winter wheat, because of adverse weather, the payment is $4 an acre. For destruction due to natural causes, or for plowing under or otherwise physically incorporating the crop into the soil, or for clipping, mowing, or cutting the crop—the payment will be based on the smaller of an appraised yield for the farm—with a floor of $6 an acre.

The Conservation Reserve covers all cropland other than that on which allotments are in effect. Under it, a farmer can get an average $10-per-acre annual rent from the government, plus up to 80 per cent of the cost of installing grass or other conservation practice. Whereas the Acreage Reserve runs from year-to-year on a calendar basis, the Conservation reserve puts farmers under contract for at least three years.

This part of the program is just beginning, with very few details out to the field. It is the Conservation Reserve where fertilizer gets directly into the picture, since USDA is authorized to pay part of the cost of applying plant food to land put into the Bank.

Sales representatives should keep close contact with the County Agricultural Stabilization Committees which will have full authority to run the program. Thirty days after farmers have signed up for the Soil Bank, the committees are authorized to release the names of farmers who have signed up.

Mastitis ointments containing penicillin are coming under close scrutiny from the Food & Drug Administration. The last in a series of sample surveys made across the country by FDA showed that 6 per cent of marketed milk contains traces of penicillin.

The FDA tentatively scheduled September 10 for a conference with antibiotic manufacturers and health officials to find a solution to the problem.

VIEWING WASHINGTON

on business

The new multi-billion dollar super highway network program gets under way July 1 and will run through 1969. House-Senate conferees finally have ironed out major differences in proposals to divide the federal funds involved among the states. The bill calls for a record $33.4 billion to underwrite construction of 41,000 miles of interstate highways.

The final bill authorizes Federal outlays of $25 billion over the next 13 years. The Federal government will pay 90 per cent of the cost and the states 10 per cent. It also starts a gradual step-up in the regular Federal-aid highway program by authorizing appropriations of $2.5 billion in the next three years. These would be matched dollar-for-dollar by the states. Construction of park, forest and other public roads financed entirely by the Federal government also would be expanded with appropriations of $448 million in the next three years. Distribution among states of the highway fund would be based on each state's population, size and mileage of rural postal routes during the first three years.

Food & Drug Administration officials hope to decide by the July 22 deadline whether to grant an exemption from a residue tolerance for **diphenyl,** offer an alternative tolerance, or rule that no residue of the chemical is permitted. While diphenyl generally is an industrial chemical, Crown-Zellerbach Corp., of California, was using it on wrappers for oranges as an end-rot or mold inhibitor up to February, 1953. C-Z has petitioned for a complete exemption from the tolerance, following notification by FDA that diphenyl is a "poisonous or deleterious substance" when used on food. The USDA considers the chemical as "useful," thus clearing the way for FDA action.

Odds are that the use of diphenyl will be approved, with possibly a tight tolerance rule.

A continuing study of the effect of insecticides, herbicides and fungicides on fish and wildlife is being proposed by Rep. Lee Metcalf of Montana. Metcalf, backed by sportsmen, conservationists and foresters, sponsored a bill to authorize $280,000 a year for continuing studies by the Interior Department.

The House has passed, and the Senate is expected to go along on, a bill to tighten antitrust law provisions forbidding sellers in interstate commerce from differential charging of customers to the injury of competitors. The measure is designed to overcome the effect of a 1951 Supreme Court decision that the bill's supporters said opened a "loophole" in the Clayton Antitrust Act, as amended by the Robinson-Patman Act of 1936.

The Court decision interpreted existing law as providing that it is a complete defense to a charge of price discrimination, regardless of the injurious effects on competition, for a seller to show that a price differential was made in "good faith" to meet a lawful and equally low price of a competitor. The House-passed bill would prohibit the use of the "good faith" defense if the effect of price discrimination was to "substantially lessen competition or tend to create a monopoly."

You can look for renewed talk of a tax cut before Congress adjourns—if signs of a business slump continue to develop during the next few weeks. Right now, the Administration has its fingers crossed—business is in a state of flux. Inflationary pressures remain strong in some lines while soft spots have developed in autos and other fields. These conflicting trends explain the disagreement of Administration officials with the Federal Reserve Board discount rate interest, the fifth credit retainer in a year.

Chemicals

215—National Potash

An eight page booklet, now available, will introduce your newest source of K_2O, National Potash Co. The brochure describes the company, its personnel and the $19 million facilities now under construction near Carlsbad, N. M. Mining operations will be conducted at a much lower depth than any other domestic installation and storage and shipping facilities have been designed to meet efficiently the annual peak demand period. Production is scheduled to begin in January, 1957. For a copy

CIRCLE 215 ON SERVICE CARD

216—Monsanto Solution

Monsanto phosphatic fertilizer solution blends with other plant food sources to make a neutral liquid fertilizer that is exactly balanced to the grade you want. It aids in keeping your formulation clean and free flowing. The firm has available complete technical and business data on liquid mixed fertilizers.

CIRCLE 216 ON SERVICE CARD

217—Granular DDT

Granular DDT made with granular Attaclay, says Minerals & Chemicals Corp. of America, has excellent poison release properties, uniform particle size distribution, almost no drift and doesn't clog the applicator. A larger payload is possible and there is no caking in storage. For a bulletin on corn borer control and the USDA approved granular DDT method

CIRCLE 217 ON SERVICE CARD

218—Chlordane & Mosquitoes

With chlordane formulations, home owners can rid home and yard of these pests, says Velsicol Corp. Aerosols, dusters or sprayers can be used for effective, economical applications providing lasting relief. For a small folder describing the use of chlordane in controlling the pest

CIRCLE 218 ON SERVICE CARD

219—Cosden Xylene

High purity xylene (ASTM D 846–51, 10°) is available through Midwest distributors from Cosden Petroleum. Of special interest is the material's premium toxent solvency, superior stability, mild odor, and 80° F min. flash. If you formulate insecticides or herbicides, complete specifications and delivery information is available.

CIRCLE 219 ON SERVICE CARD

FREE INFORMATION to help you solve fertilizer, pesticide problems

Reader Service

220—Nitroparaffin Papers

Full texts of papers presented at a recent series of nitroparaffin symposiums held under the auspices of Commercial Solvents are included in a new brochure. If interested in the applications of these chemicals

CIRCLE 220 ON SERVICE CARD

How to use the READER SERVICE CARD

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221—Pelletizing Unit

The C. E. Small pelletizing unit is described in a folder from the Chemical Engineering Service Div. of Manitowoc Shipbuilding. Designed for simplicity of operation it can be used to granulate products such as a 3-12-12 grade, a difficult project with some other systems. No sulfuric acid is required on low nitrogen grades and resulting moisture content is 2.5 per cent or less. For a folder and information

CIRCLE 221 ON SERVICE CARD

222—Mixer Drive Heads

LFR slow speed drive heads from International Engineering can be used in closed or open vessel operation with any standard motor at speeds from one to 350 rpm. The units are factory assembled and aligned, ready to run when installed. FR slow speed drive heads use standard NEMA foot mounted motors, have a speed range of two to 1150 rpm, are somewhat less expensive than the LFR and are particularly adapted to those uses where head room is not at a premium. For a descriptive folder

CIRCLE 222 ON SERVICE CARD

223–224—New Mixers

Two new mixing units are described in literature from Strong-Scott Mfg. The new Porta-Blend is a portable liquid and dry mix blender with self contained power and feeder units. A horizontal triple action mixer is termed ideal for mixing wet or dry materials and blending those of pulverized or circle granular sizes.

223—Port-Blend
224—Horizontal Mixer

Materials Handling

225—Sensing Devices

A two-page technical reference from Richardson Scale describes automatic sensing devices that can indicate a lack of material supply or flow in a handling operation. Warning is provided by bell, horn, light or other means providing an automatic safeguard against interruption or failure of a system or process. The three models include material level control, blade no-flow alarm and paddle no-flow alarm. For a copy

CIRCLE 225 ON SERVICE CARD

226—Corrigan Facilities

In a new 8-page booklet designed to assist engineers, superintendents and purchasing agents, J. C. Corrigan Co. reviews its conveyor fabrication facilities and services. For a copy

CIRCLE 226 ON SERVICE CARD

227—PVP Memorandum

Polyvinyl chloride (PVP) pipes, valves and fittings are described in a Peter A Frasse & Co. engineering memorandum. It covers in detail the corrosion resistance, general properties, fabricating characteristics and economies of this material.

CIRCLE 227 ON SERVICE CARD

Packaging

228—New Southland Packer

Chase Bag is distributing exclusively the new Southland fertilizer packer, termed a simple, functional and practical unit. Manufactured by Chattanooga Boiler & Tank Co., it is unaffected by vibration and includes high-capacity wiring for added safety. Only one scale system is used to pack up to 25 bags per minute and maintained weighing accuracy is guaranteed on 50, 80 and 100 lb. bags. Microswitches are supplied which, unlike mercury switches, will not "splash" to trip the weigh hopper accidentally. For complete information

CIRCLE 228 ON SERVICE CARD

229-231—New H&D Booklets

Hinde & Dauch has added three booklets to its little packaging library series: (1) a revised edition of "How to Test Corrugated Boxes" discussing the importance and procedure of pretesting; (2) "How to Prepak in Corrugated Boxes" a revised edition exploring all phases of this procedure; and (3) "How to Seal Corrugated Shipping Boxes," thoroughly revised to explain all facets of modern package sealing.

Circle
229—Testing Corrugated Boxes
230—Prepaking in Corrugated Boxes
231—Sealing Corrugated Boxes

232—Improved AF Bagpaker

International Paper's model AF Bagpaker has now been modified and simplified to include a variety of improvements. The rotary turret unit has been in use in the industry for the past 25 years packing from 20 to 25 multiwall bags per minute with one operator. Automatic sewing reduces bag size and cuts cost and the paker features simplified operation and maintenance. For detailed information

CIRCLE 232 ON SERVICE CARD

233—Hi-Bake Pails

Hi-Bake pails produced by Bennett Industries give positive protection in storage and in transit. Linings are selected to properly hold your individual product and containers are pretested at the factory. According to Bennett they are surprisingly low in cost. For a booklet with the facts on lined containers

CIRCLE 233 ON SERVICE CARD

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234—Bemis Packer-Ette

This automatic bag packer is designed for speed and economy in medium sized packing operations handling bag sizes from 25 to 150 lbs. with high accuracy. It will handle any material that establishes an angle of repose, has a maximum height of 97⅝" and a shipping weight of only 600 lbs. For information

CIRCLE 234 ON SERVICE CARD

Application

235—Simonsen Spreader

The fertilizer spreader produced by Simonsen was designed by men engaged in applying high analysis plant foods. A new hood design with rubber shock absorbers aids in reducing maintenance costs and parts that must be kept corrosion free are of stainless steel. Other features include hydraulic power systems replacing gear boxes, power take-off drives and auxiliary motors; compartment doors with hinges outside the box and a box designed for larger payloads without addition of sideboards. For more information

CIRCLE 235 ON SERVICE CARD

236—Krause Applicator

New to the Krause line is a do-it-yourself liquid fertilizer applicator in kit form, designed for tractor mounting. The Krause-Liberty hose pump is incorporated with a design said to eliminate corrosion and vapor lock problems. For a folder

CIRCLE 236 ON SERVICE CARD

Miscellaneous

237—Ammonia Test Paper

Nitrogen Division, AC&D, offers to fertilizer manufacturers and NH_3 distributors a booklet of ammonia leak test papers designed to test tanks and systems containing ammonia. For a packet containing 16 test strips, manufacturers and distributors can

CIRCLE 237 ON SERVICE CARD

238—Time-Zone Guide

US Industrial Chemicals offers a handy 8½" x 7¼" guide to time-zone and daylight saving time differences in the US. It shows at a glance the states using daylight-saving time and also the states in which most cities of 25,000 population or over use daylight-saving time.

CIRCLE 238 ON SERVICE CARD

239—Ideas in Motion

This is the title of a 16-page full color book from G & G Film, released to acquaint you with the uses and advantages of commercial motion pictures. It shows the different uses of service, product, sales and institutional films, illustrates what goes into producing a movie and relates case histories of firms using G & G produced motion pictures. For a copy

CIRCLE 239 ON SERVICE CARD

See pages 57, 60, 62 for information on these Reader Service numbers—

240—Formulation Pad
241—B & L CoactoR
242—Joy Limberoller
243—Exact Weight Scale
244—Schelm Catalog
245—Select-O-Weight
246—Kelly Grinder
247—Perma-Lined Cars
248—Phenoline 305

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GOVERNMENT

USDA Ups Support Prices for 4 Grains

Increased support prices for 1956-crop oats, barley, grain sorghums and rye have been announced by USDA reflecting 76 per cent of their parity prices as of May 1, 1956.

National average support rates are: Oats—65 cents per bushel for Grade 3 or better; Barley—$1.02 per bushel for Grade 2 or better (except mixed barley); Rye—$1.27 per bushel for Grade 2 or better or No. 3 on test weight only; Grain Sorghums—$1.97 per hundredweight for Grade No. 2 or better (except mixed grain sorghums).

Support rates previously announced reflected 70 per cent of the January 15 parity price. The revised prices compare with average support prices for 1955 crops of 61 cents for oats, 94 cents for barley, $1.18 for rye and $1.78 for grain sorghums.

ICA Authorizations

India. $420,000—nitrogenous fertilizer and plant test kit for fertilizer demonstration project (PIO/C No. 86-13-001-5-60225). Source: World wide. Terminal delivery date: Dec. 31. Procurement through Emerg. Proc. Serv., GSA.

$486,600—agricultural pesticides for filaria control program (PIO/C 21-31-016-5-60024). Source: World wide. Terminal delivery date: Aug. 31. Procurement through Emerg. Proc. Serv., GSA.

Indonesia. $120,000—nitrogenous fertilizer (PIO/C No. 97-11-004-5-60278). Source: World wide. Terminal delivery date: Sept. 30.

$65,000—phosphate fertilizers (PIO/C No. 97-11-004-5-60280). Source: World wide. Terminal delivery date: Sept. 30.

$15,000—potash fertilizer (PIO/C No. 97-11-004-5-60279). Source: World wide. Terminal delivery date: Sept. 30.

Proc. on above three authorizations through Emerg. Proc. Serv., GSA.

Quisenberry Named Crops Research Dir.

Dr. Karl S. Quisenberry succeeds Dr. A. H. Moseman as director of crops research in USDA's Agricultural Research Service, effective July 1. Dr. Marion W. Parker will replace Dr. Quisenberry as assistant director. Dr. Moseman has resigned from government service to accept a position with the Rockefeller Foundation as associate director for agricultural programs.

Public Hearing on Allotments Scheduled

An informal public hearing was scheduled for June 19 in Denver, Colo. to hear views and recommendations for use in establishing farm acreage allotments for the 1957 sugar beet crop.

Conditions for 1956 Corn Crop Support

Agriculture Secretary Benson recently announced conditions of eilgibility for 1956-crop corn price supports, reflecting provisions of the Agricultural Act of 1956.

Maximum price support for corn will be a national average of $1.50 a bushel in the commercial corn area. Farmers in the area may become eligible for this maximum level by complying either with their corn acreage allotments or with the new Soil Bank price support requirements for corn price support.

Fertilizer Experts Off to Korea for ICA

A Fertilizer Consultant Team, now being recruited with the aid of USDA and the National Plant Food Institute, will go to Korea this summer for the International Cooperation Administration to study chemical fertilizers, the agency's largest and most costly assistance item to Korea.

The group will analyze Korea's fertilizer requirements and procurement and distribution system from the agricultural standpoint, and will make recommendations for the guidance of ICA.

Before Korea was divided by the communists, North Korean fertilizer production was sufficient to meet the country's needs. Loss of these plants behind the Iron Curtain, together with the influx of four to five million refugees from the North greatly increased food production requirements of South Korea and made the fertilizer problem one of the most critical facing the republic.

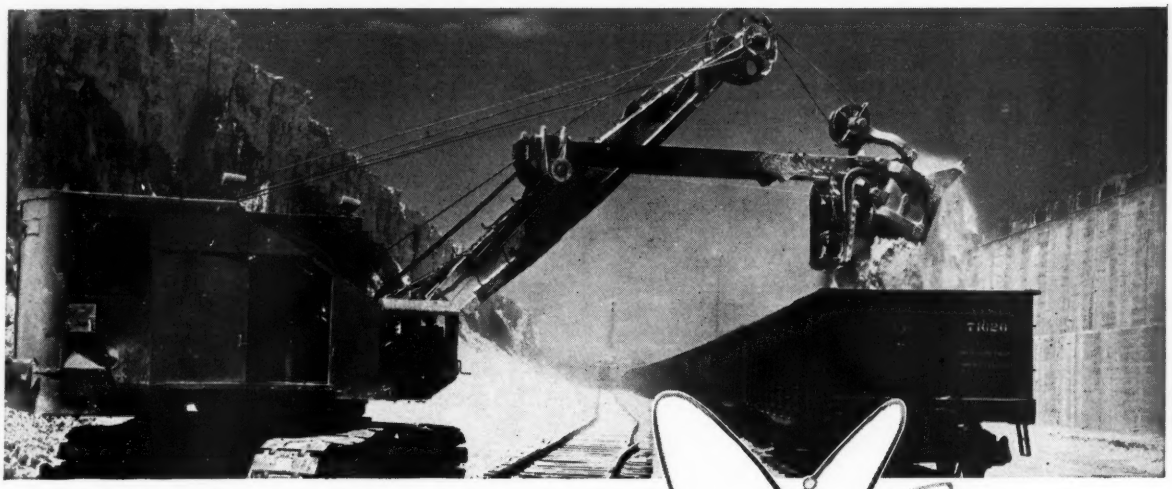
Two plants, financed by the U. S., are scheduled to be built to supply two-thirds of Korea's nitrogenous fertilizer needs, thereby reducing the country's dependence on continuing aid from the U. S. One plant is now being constructed by McGraw-Hydrocarbon Inc. under an ICA-financed contract and the other still is in the planning stage. Type and quality of materials that may be needed from the second factory also will be studied by the group.

CCC Begins Selling Its Upland Cotton

On June 12 the Commodity Credit Corp. began accepting offers to buy its upland cotton under the current export program on a competitive bid basis at prices equal to or above the price level determined in accordance with the provision of the Agricultural Act of 1956.

SULPHUR

helps to create headline products



URANIUM

Ore milling specialists have settled upon acid leaching as the most practical and economical way to extract uranium values from ore concentrates. And as with so many other ore-leaching processes, sulphuric acid appears to be the best of the solvents, considering costs and availability.

So chalk up another 'headline' end-use for this most widely used of all acids! But this very broadening demand for sulphuric emphasizes the problem facing producers of the basic element SULPHUR. Search for new commercial sources goes on without let-up all over the world. This company is playing a leading role in this search.

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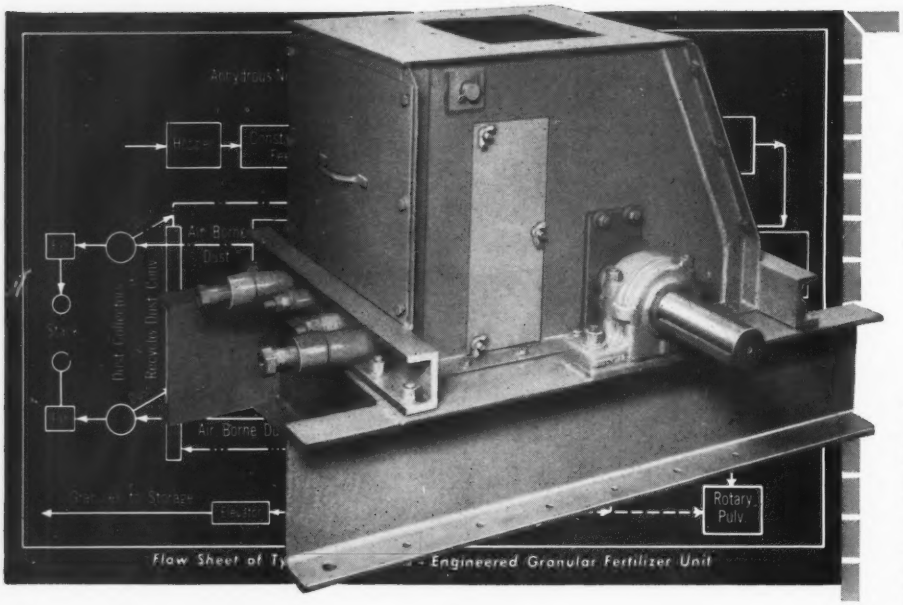

IT'S STURTEVANT-ENGINEERED TO GRIND UP TO 35 TONS OF TAILINGS PER HOUR

Mixing plant operators agree! They'll tell you that a Sturtevant Rotary Pulverizer beats anything else for keeping a granular or powdered fertilizer unit speeding along at full capacity. It's far better than Hammer Mills with hammers that stick . . . Cage Mills that skip small pellets . . . Knives that only slice and shear. No overload stoppages nor clogged grates. So, daily accumulation of over-sized lumps is no longer a problem. And, to top it off, original Sturtevant "Open-Door" accessibility makes cleaning quick and easy.

Sturtevant Engineering can also help you in other ways. For more than 75 years, leaders in the fertilizer industry have depended on us for assistance in designing their units and in keeping them up-to-date. Since we custom-build mixers, batching units, granulators, hopper and conveying systems to fit agreed-upon specifications, you can be sure of getting a complete unit or individual components that fit your requirements like a glove. Why be satisfied with anything less?

Investigate now! Filling out the convenient coupon at the right is the first step toward better fertilizer at lower cost. Why not mail it today?

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The "OPEN-DOOR" to *lower* operating costs over *more* years

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Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

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First-Year Gains Seen In NPFI Consolidation

1100 Attend Convention, Hear Fulbright Address, Elect Prindeville and Pate to Head Institute

Senator J. W. Fulbright of Arkansas, who addressed the convention on foreign aid.

IT IS not important that countries receiving US foreign aid "love us," Senator J. W. Fulbright said at the first annual convention of the National Plant Food Institute; we should be more concerned that those areas receiving aid develop into successful, self-governing units.

Fulbright headed the June 10–13 program at the Greenbrier, White Sulphur Springs, W. Va., which attracted better than 1,100 persons.

Joseph A. Howell, Institute president and head of Virginia-Carolina Chemical Corp., was unable to attend the sessions but forwarded a statement terming the consolidation of two previous organizations into NPFI a step providing the industry with a stronger voice, a coordinated organization, a competent staff and practical programs designed to give our industry greater prestige, to focus greater attention on the importance of our products and their contributions toward building a stronger national economy.

"The creation of the Institute," he continued, "has provided us a more efficient vehicle for working with other organizations in fostering a sound land management program in which plant foods play a vital part.

"We do not have to indulge in flattery when we say that the predecessor organizations of the National Plant Food Institute warmly were received around the council tables of agricultural leaders. More important, that acceptability is still enjoyed today by our Institute. But, our first anniversary has even greater significance in terms of strengthening the position of the fertilizer industry among those organizations and dedicated people, working har-

NPFI Director Dies

George E. Petitt

On the eve of the first convention of the National Plant Food Institute, George E. Petitt, vice president and director of the Potash Company of America and a director of NPFI, died at his home in Washington, D. C.

Petitt entered the fertilizer industry with Alexandria Fertilizer and Chemical Co. and later, when the firm was purchased by Virginia-Carolina Chemical Co., remained with V-C. He was named general superintendent of Armour Fertilizer Works in 1928, subsequently was named vice president of Chilean Nitrate Sales Corp., and in 1949, joined PCA as vice president in charge of sales.

In addition to his NPFI post, Mr. Petitt was a director of American Potash Institute and the Potash Export Association.

moniously and effectively, for an improved economic position for farmers. . . .

"We are more than a billion dollar industry. Each year, we are spending a little more than a half-million dollars for promotion—to tell our story, to conduct our programs with the land-grant colleges and our work with the many other organizations, agencies and media that have farmers as their customers.

"In the years ahead," predicted Howell, "we will find it necessary to expand our Institute programs, projects and services if we are to meet new competitive conditions. . . . A better selling job is still ahead of us." His statement was read to the members by Ralph B. Douglass, president, Smith-Douglass Co., a member of the NPFI board of directors.

Coleman Reports on NPFI

In his progress report, NPFI executive vice president Dr. Russell Coleman described the fields of current Institute activity including work on legislative developments. Last year, he reported there were 15 national and 14 state bills that in some way affected the industry. Coleman noted in particular the activity carried out by NPFI at the time freight rate increases were sought by domestic railroads.

The Institute, continued Coleman, now is distributing seven films and last year NPFI pictures were shown to an audience estimated at over 300,000 persons. In another phase of information-education work, news releases are sent to publications throughout the country and a farm radio news service serves over 1,000 stations.

Coleman reiterated the fact that fertilizer has an ever growing future as a tool with which farmers can lower their unit cost of production.

Expanding his remarks on foreign policy, Senator Fulbright added that we should not attempt to force a free enterprise system on some of the underdeveloped areas of the world because they are incapable of successfully maintaining such a system.

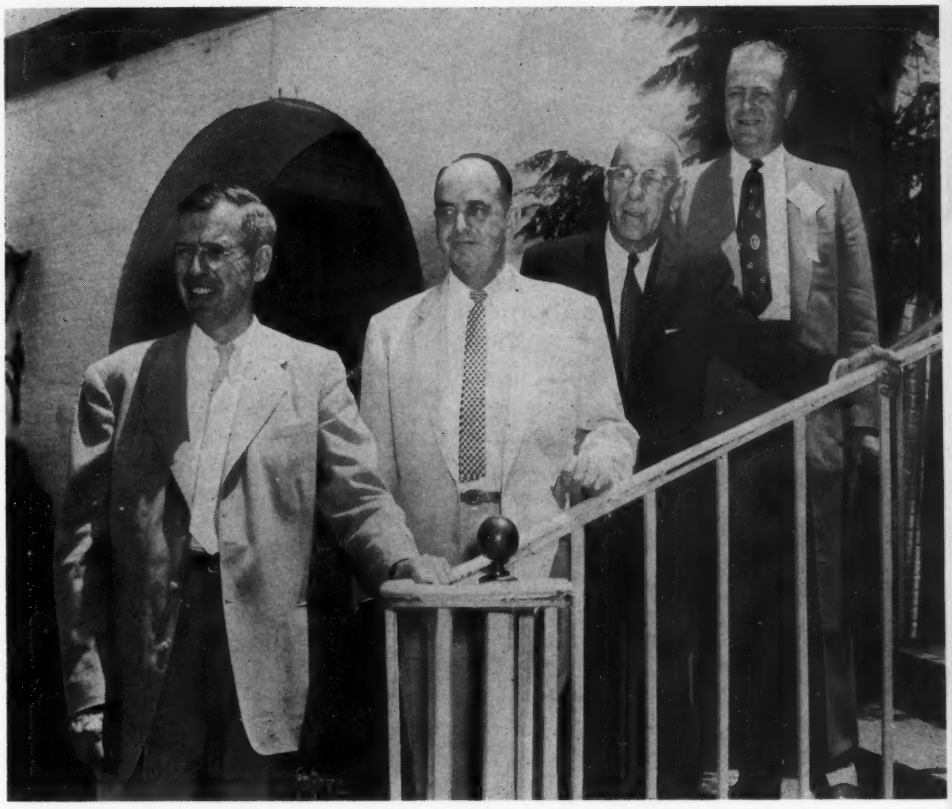
The Arkansas legislator agreed that the current foreign aid bill places too much stress on military assistance and not enough on economic fields. We have made, he added, too little progress in areas of ideas and human relations. Some 85 per cent of total foreign aid appropriations, he reminded listeners, is for military assistance. The aid program is "a new venture for the United States of trying to influence these peoples, forced on us by the virtual collapse of Western European democracies."

Changes now occurring in the under-developed countries are of extreme importance, said Fulbright, and moves toward democratic lines or to authoritarian systems are of basic importance to our survival.

Influencing the Farmer

Dr. J. M. Bohlen and Dr. G. M. Beal, associate professors of rural sociology at Iowa State, told Institute members that although most farmers would go to an agricultural agency (primarily the agricultural colleges) for information on a *new* fertilizer, the majority begin using plant foods as a result of contact with other farmers.

The Iowa State economists described the stages



Standing on the Greenbrier steps are John Ott; E. A. Geoghegan; R. J. McGinnis, editor, Farm Quarterly; and Carl Rose, Nat'l. Assn. of County Agric'l. Agents.

through which the individual passes in learning about and adopting or disregarding a new idea or practice—Awareness, Information, Application, Trial and Adoption. (See FARM CHEMICALS, July, 1955, for a discussion.)

Six classes of individuals appear in the sequence, they continued: innovators, early adopters, informal leaders, majority, later adopters and non-adopters.

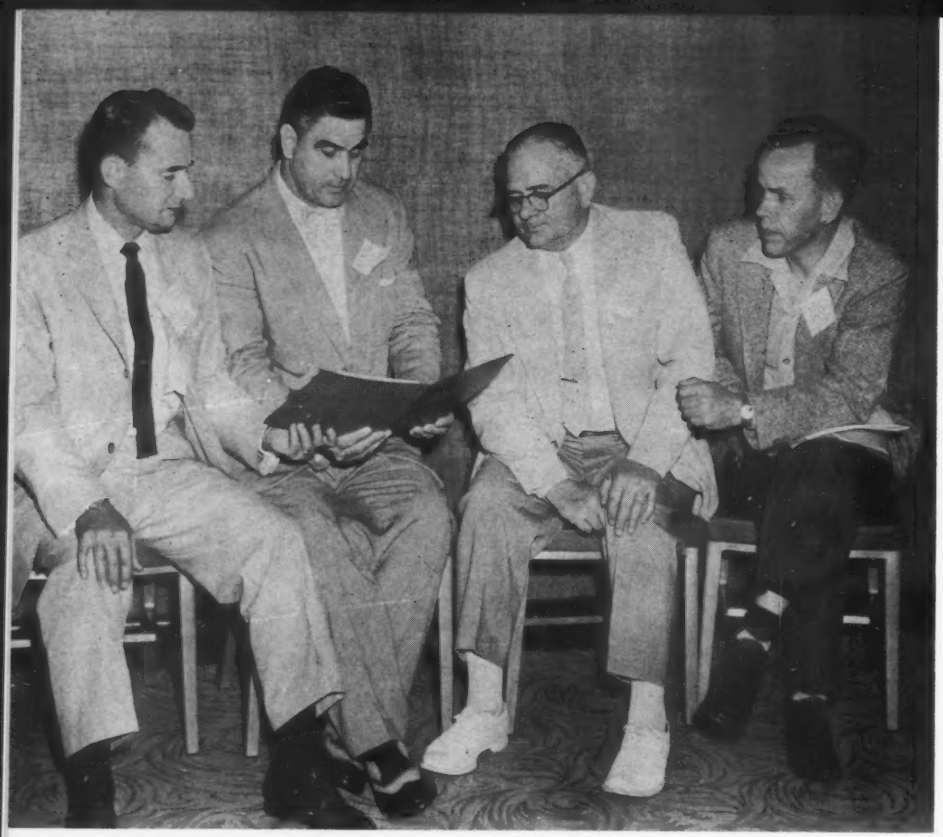
The informal leaders, said Drs. Beal and Bohlen, are "looked up to by the majority in their neighborhood as the fellows to see for advice and information on farming." They suggested that more work might well be done with individuals in this category.

In the time sequence, the adoption rates often jump quickly after informal leaders take up an idea or practice, it was reported, and although friends and neighbors don't think of them as leaders, their judgment is respected and sought.

At present, the researchers pointed out, contacts are often made with early adopters, a category that does not have the same following in the community as the informal leader group and which is looked on more as including "experimenters."

While early studies showed fertilizer salesmen in a

Louis H. Wilson, NPFI secretary (center), presents Soil Builders Awards to Paul C. Johnson, editor of PRAIRIE FARMER, and R. J. McGinnis, editor of THE FARM QUARTERLY for "superior journalistic contributions toward the building of the soils of our nation."



Officers of the NPFI Research and Education committee. W. H. Garman, secretary; Bordon Chronister, Nitrogen Div., and George Serviss, G.L.F. Soil Bldg. Service, co-chairmen for 1955-56 and A. H. Bowers, Swift & Co., the newly-elected vice chairman.

relatively poor position in influencing the farmer on fertilizer adoption and use, Bohlen and Beal noted that later work indicated the salesman gaining in position, particularly the local dealer.

A smash hit on the program was John Ott and his amazing time-lapse photographic studies. The president of John Ott Pictures, Inc., Winnetka, Ill., his main presentation included pictures of his new time-lapse, air-conditioned greenhouse made of plastic which permits more of the sun's rays to penetrate than will pass through glass. Ott also described the various devices he has developed over the past 30 years for making time-lapse pictures.

Time-lapse portions of the film included sequences showing the development and growth of bananas, and new microscopic subjects involved streaming of cell protoplasm, cell division and development of pollen tubes.

Time-Lapse Film Studies

Through his ingenious photographic laboratory set-up, Ott showed the growth of plant roots in the soil and their contact with plant food particles. He also demonstrated the dramatic recovery and growth response of a plant from an extreme chloratic condition upon treatment with an iron chelate.

Ott gave another showing for the ladies' program and included pictures of a variety of colorful orientals including new varieties of camellias from China's Yunnan province and unusual orchids. These films were used by RCA and NBC on closed color television circuits.

Some of the pictures shown are being edited into Walt Disney's latest feature film, "Secrets of Life," scheduled for a premier showing in the fall. In addition, a portion of the films will be used on the September 26 Disneyland program which will feature Ott and his time-lapse photography.

Dramatize Your Selling

Management should make a greater study of men said Glenn Fouche, president, The Stayform Co., in his talk on "Dramatize Your Selling." "Nine-tenths of our problems will be solved," he claimed, "when we have learned better to manage men.

"When conditions are not as we would like them," he said, "we sometimes blame vague conditions—vague personnel—vague labor conditions, when all the time, the real trouble lies in—vague management."

Commenting that we have mastered machines and have found methods of getting greater production from our equipment, he added that this is not true of the human element of our industrial plant. A man's thoughts and "how to make him more productive—is still our great and largely unexplored new frontier.

"The study of man," Fouche continued, "must necessarily begin with the man we know best—ourself. Management too often is thought of as the mere delegation of authority to others. We can, of course, delegate authority but we cannot delegate leadership."

Four human desires must be recognized by a suc-

cessful manager, he noted—security, recognition, a sense of belonging and new experiences and growth. "If we are to manage men," stressed Fouche, "we must take into consideration man, his age or maturity and his relationship to other men.

"Each salesman sells not products, but ideas," claimed Fouche, "and when we have a shortage of ideas, we have a surplus of products." . . . "In America," he concluded, "as nowhere else in the world, the salesman reigns supreme. He keeps the goods moving—which keeps the factories running. Salesmen are the advance agents of modern civilization."

Awards to Farm Editors

Soil Builders Awards for Editors were presented by Louis H. Wilson, NPFI secretary and director of information, to Paul C. Johnson, editor of PRAIRIE FARMER and to R. J. McGinnis, editor of THE FARM QUARTERLY for "superior journalistic contributions toward the building of the soils of our nation."

Scrolls signed by the national judges were awarded Johnson, representing the winner among magazines of more than 300,000 circulation and to McGinnis, representing magazines with under 300,000 circulation. They were selected from a field of 40 farm magazine entries with a total readership exceeding 30 million. Features judged included stories, editorials, illustrations and combinations of these three categories.

Johnson was awarded the American Farmers degree by the Future Farmers of America, in 1952; received the Reuben Brigham Award for meritorious service to agriculture, presented by the American Association of Agricultural College Editors, in 1954; was president of the American Agricultural Editors' Association, 1952–53; served as president of the American Country Life Association, 1954–55; and

Top Institute Officials: Edwin Pate, chairman of the board; Dr. Russell Coleman and Paul T. Truitt, executive vice presidents; and C. T. Prindeville, president.

was awarded the Distinguished Service Medal of the National 4-H Club Camp, in 1953.

McGinnis was head of the journalistic department and director of publications at Miami University, 1932–1941 and also served in the United States Army, 1941–1945.

He was co-founder of THE FARM QUARTERLY and has been editor-in-chief since 1946.

Judges for the contest were Nolen J. Fuqua, president, The National Association of Soil Conservation Districts; Roger Fleming, secretary-treasurer, American Farm Bureau Federation; Wesley Hardenbergh, president, American Meat Institute; Herschel D. Newsome, master, The National Grange; Robert Howey, president, National Vocational Agricultural Teachers Association, Inc.; and Fletcher Farrington, president, National Association County Agricultural Agents.

Commend V-C's Howell

A resolution was unanimously adopted by the board of directors commending Mr. Howell "for the many services, contributions and the outstanding leadership" he provided as first president of the Institute. The resolution commented on his prominent work in both uniting the fertilizer industry under one national trade association and in resolving a variety of organizational problems encountered during NPFI's first year. Howell's "forceful leadership and unfailing efforts . . .", continued the resolution, "have contributed substantially to the betterment of both the fertilizer industry and its trade association. . . ."

A second resolution expressed deep regret at the untimely death of George E. Petitt, a director of the Institute and an officer of Potash Company of America. "Mr. Petitt," noted the resolution, "has served with distinction as a member of the board of directors of the National Plant Food Institute and has otherwise contributed generously of his time and talents in furthering the interests of the fertilizer industry."

New Officers, Directors

Charles T. Prindeville, vice president, Swift & Co., was elected president of the Institute succeeding Howell, and Edwin Pate, president, Dixie Guano Co., is chairman of the board, a post previously held by E. A. Geoghegan, Southern Cotton Oil Co.

Other officers of the Institute, all of whom were re-elected are Paul T. Truitt and Dr. Russell Coleman, executive vice-presidents; W. R. Allstetter, vice-president; Louis H. Wilson, secretary; and Wm. S. Ritnour, treasurer.

Members of the executive committee, in addition to Pate and Prindeville, include Geoghegan; W. E. Shelburne, Armour Fertilizer Works; John A. Miller, Price Chemical Co.; G. Fred Coope, Potash Co. of America; Hugo Reimer, Nitrogen Division, AC&D; Marlin G. Geiger, Davison Chemical Co.; and J. H. Epting, Epting Distributing Co.

The thirteen new members of the board of directors include W. G. Hewitt, Pacific Guano Co.; H. A. Parker, Sylacauga Fertilizer Co.; Walter E. Meeken, Consolidated Rendering Co.; Frank S. Washburn, American Cyanamid Co.; S. M. Hackett, Dixie Fertilizer Co.; A. F. Reed, Lion Oil Co.; L. Dudley George, Richmond Guano Co.; H. E. Wood, The Farmers Fertilizer Co.; P. J. Gum, Ridge Fertilizer Co.; B. W. Bellinger, Tennessee Corp.; Dean R. Gidney, U. S. Potash Co.; J. E. Nunnally, Cotton Producers Assn.; and G. F. Coope, Potash Co. of America. Coope was elected to fill the unexpired term of the late George E. Petitt, also of Potash Co. of America. ▲

The Casino, headquarters for NPFI golfing activities.

Opportunities in

WORLD PESTICIDE SALES

Part I

By John Harms

BEST opportunities for expansion of pesticide sales lie in specialized products for specific purposes—both at home and abroad. This is the chief conclusion reached in a special study, "World Survey of Pest Control Products," recently completed by the Commerce Department's Chemical and Rubber Division.

In the U. S., capacity for production of pesticide materials, percentagewise, probably will not increase in volume at so great a rate in the next 10 years as it has in the past decade, according to the study. Present facilities for manufacture of such products as DDT, benzene hexachloride, calcium and lead arsenates, copper sulfate and some of the specialized commodities produced by only one or two companies are greater than required to meet domestic consumption and export demand. But . . . "the trend is definitely toward specialized products for specific purposes, and future expansion in production undoubtedly will be along this line."

Overall consumption of pesticides in the United States has been rising for a number of years, the study points out. With the decrease in farm acreage in many areas and the shortage of farm labor, there is need for much greater use in order to meet rising demands for agricultural products by the ever-increasing population. The study says *the degree of increase is largely dependent on education of farmers* regarding the benefits to be derived, such as greater monetary returns per acre and lessened labor.

As far as the foreign situation is concerned, the Chemical and Rubber Division has this to say: In spite of increasing manufacture of pesticides in many industrialized countries and keen competition in export markets—particularly from West Germany and other European countries—U. S. exports of pesticides have shown a steady increase for many years. Value of 1955 exports exceeded that of all former years. It appears that a particularly promising export market exists in miscellaneous agricultural insecticides and related materials—which includes specialized pesticides, many of which are not produced outside the United States. Value of exports in this category rose from $24,526,000 in 1954 to $32,026,000 in 1955—an increase of 30 per cent.

The study says that imports of pesticides into the U. S. are "negligible" except for such raw materials as arsenic (for manufacture of arsenates) pyrethrum flowers and extract, and rotenone-bearing roots.

Export markets, on the other hand, have of course risen tremendously. For example, from $4,975,00 in 1939, they had risen to $18,505,000 by 1945; by 1953 were $49,060,000; in 1954 rose to $62,740,000 and in 1955 totaled $79,133,000.

Here briefly is a catalog of the outlook in Western Hemisphere countries for U. S. pesticide sales and service—based on reports from industry sources, Bureau of Foreign Commerce and Foreign Service reports:

Canada. The growing market for pesticides, and the apparent reluctance of domestic capital to underwrite research, manufacture and marketing of new products, opens the field for U. S. capital and technical knowledge. Not only is there opportunity for increased use of pesticides, but also for improvement in their effectiveness. U. S. capital could probably be best employed in the establishment of branch plants for formulating pest control products—using U. S. facilities for production of toxic ingredients. It is suggested that exporters pay increased attention to promotion and marketing, giving greater care to selection of agents and distributors, concentrate on specialized products for specific purposes, and, finally, devote more research and testing to development of pesticides especially adapted to Canadian requirements.

Costa Rica. Future prospects for U. S. pesticides to increase their share of this market may be rated as good (except with regard to copper

Mexican Imports of Pesticides, 1953

Commodity classification and principal countries of origin	Quantity (pounds)	Value (U. S. dollars)
Copper sulfate:		
United States	1,801,258	188,292
Other countries	564	214
Total	1,801,822	188,506
Copper arsenate and arsenite for production of insecticides:		
United Kingdom	26,905	3,875
United States	40,547	5,295
Other countries	75	5
Total	67,527	9,175
Strychnine for preparation of insecticides (probably rodenticides):		
United States	84,538	13,689
Other countries	166	1,768
Total	84,704	15,457
Nicotine sulfate:		
Netherlands	3,175	1,492
United States	39,030	20,882
Total	42,205	22,374
Insecticides with less than 40% DDT:		
United States	293,942	33,350
Other countries	136	60
Total	294,078	33,410
Insecticides with 40–70% DDT:		
United States, total	2,523,784	429,084
Insecticides with over 70% DDT:		
Germany	730	161
United States	3,152,203	799,437
Total	3,152,933	799,598
Agricultural insecticides, n. e. s.:		
Canada	179,040	11,210
Germany	758,272	311,149
Netherlands	68,100	22,585
United States	26,545,746	3,211,741
Other countries	50,787	16,843
Total	27,601,945	3,573,528
Chlorobenzene for fumigants:		
United States	2,388,558	523,435
Other countries	9,350	9,994
Total	2,397,908	533,429
Other insecticidal preparations, total	550,000	n. a.
Grand total	36,516,906	n. a.

Source: Mexican official trade statistics.

sulfate). There is a preference for these products. Recommendations: Intensification of advertising, particularly by radio and in local farm magazines; frequent visits of Spanish-speaking traveling representatives with experience in Latin American markets; and assignment of technical experts for free advice and consultation.

Cuba. Indications are that U. S. products will continue to supply most of the market. However, advertising exclusively in Spanish and extension of more liberal credit terms probably would increase sales—and also would provide greater protection against the possibility of losing a portion of the Cuban market to European products.

Dominican Republic. The U. S. has an advantageous position in the market because of its proximity, a preference for its products, and the fact that most of the knowledge in use of pesticides has been obtained from Point IV technicians. This situation should continue unless there are substantial price differentials between U. S. and European and Japanese products.

Guatemala. The U. S. has a large portion of the pesticide market, but sales are not likely to expand greatly until a larger percentage of the Indian population becomes aware of the need for pesticides through educational and advertising campaigns.

Haiti. The concept of fighting agricultural pests has not become established here. When a crop is pest ridden, it is discontinued in favor of another. Market is limited.

Honduras. Expansion in cotton planting, a new program to build a network of warehouses and the big grasshopper campaigns open up this market. Also, an increasingly important factor in the future trend of pesticide consumption is the effort of 16 agricultural extension agencies to teach farmers how to use pesticides to improve crop production.

Mexico. Many of the principal manufacturers of pesticides in Mexico are branches of U. S. firms whose products are uniform and well received. As the market grows, the opportunity for other U. S. companies to set up plants should increase. Since importation of ready-mixed pesticides is limited, the principal means for U. S. firms to increase markets is by opening branch plants. The Mexican pesticide industry, now in its infancy, should grow rapidly within the next five years.

Nicaragua. Opportunities for U. S. capital investments in the pesticide industry here are limited by the relatively small consumption of these products other than on cotton.

Panama. The Point IV program is active and should increase demand for insecticides for cattle and crops, particularly cotton. Pesticide requirements mostly met through imports.

El Salvador. The only opportunities for in-

vestment of U. S. capital in the pesticide industry appear to be in establishment of a plant for processing deposits of diatomaceous earth for use as inert material, or by building formulating plants. German suppliers are getting a foot-hold. Price will determine future sales to this country.

Argentina. U. S. commodities enjoy considerable prestige, but until dollar availability is greater, products manufactured in areas outside the U. S. probably will continue to be imported from soft-currency areas. U. S. firms are advised to take advantage of current advanced technology and research by wide dissemination of technical literature on various products, particularly the newer pesticides. Agriculture offers the largest immediate opportunity for market expansion. Argentine pesticide research is limited and actual field tests by U. S. firms and active investigation of local pest-control problems appear advisable. Close cooperation with Argentine Government agencies operating in this field should be established. The government is emphasizing improvement of crop yields.

Bolivia. Only about 2 per cent of the land is under cultivation. This limits the market. On-the-spot investigations of local conditions, however, could pay dividends.

Brazil. It is suggested that U. S. investors and manufacturers of pesticides consider the possibility of producing basic toxic ingredients in this country. Domestically manufactured pesticides which eliminate or reduce the necessity for imports are welcomed by the government. U. S. is principal supplier.

Chile. The Ministry of Agriculture wants imports of toxic ingredients only from which local formulators can prepare finished products, using

Total United States Exports of Pesticides, by Areas and Principal Countries of Destination, 1945 and 1953-55

(Quantity in thousands of pounds; value in thousands of dollars)

Area and principal countries of destination	1945		1953		1954		1955 (preliminary)	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
North America:								
British Honduras	20	$4	37	$13	39	$18	79	$21
Canada	9,483	1,375	33,228	7,490	27,191	7,777	26,071	8,514
Canal Zone	94	13	169	66	210	71	160	39
Costa Rica	8,122	405	3,870	560	2,644	776	19,824	2,427
Guatemala	17,187	855	17,075	1,767	17,749	1,984	13,588	1,762
Honduras	14,026	714	25,973	2,644	23,157	2,432	21,843	2,539
Mexico	8,598	939	48,898	6,490	39,090	6,325	62,130	11,145
Nicaragua	137	19	5,682	1,086	18,530	3,541	18,617	4,067
Panama	8,121	408	10,450	1,056	2,370	384	13,387	1,583
El Salvador	470	45	5,333	1,042	10,711	1,794	13,108	2,361
Other[1]	50	13	.....	.....	.....	.....	.....	.....
Total[2]	66,308	4,792	150,720	22,670	141,700	25,108	188,807	34,464
South America:								
Argentina	4,293	507	838	260	2,325	939	2,964	1,300
Bolivia	604	41	172	41	326	87	158	43
Brazil	5,022	720	10,826	2,619	20,771	4,529	17,071	5,231
Chile	263	67	1,524	546	1,087	222	391	192
Colombia	3,392	348	12,580	2,060	19,155	3,250	14,615	3,301
Ecuador	217	32	1,048	365	1,029	342	733	280
Paraguay	103	14	83	24	97	41	8	4
Peru	3,753	286	11,166	1,405	9,880	1,385	7,386	2,051
Surinam	92	13	235	64	247	64	169	54
Uruguay	436	92	429	97	656	151	992	325
Venezuela	2,085	392	7,351	2,463	9,821	3,349	9,587	3,015
Other[1]	33	7	71	15	30	9	25	10
Total[2]	20,290	2,520	46,325	9,960	65,430	14,372	54,099	15,805
Caribbean Area:								
British West Indies	338	45	295	87	295	117	273	89
Cuba	3,323	500	5,879	1,307	7,112	1,553	6,127	1,606
Dominican Republic	237	28	820	115	1,675	161	3,381	380
French West Indies	70	10	6	2	23	10	19	9
Haiti	855	50	335	116	195	42	81	17
Netherlands Antilles	187	42	252	93	210	61	190	98
Trinidad and Tobago	140	25	50	23	216	160	940	357
Total[2]	5,152	702	7,640	1,743	9,730	2,108	11,011	2,556

[1] Includes those countries to which less than $10,000 worth were shipped in each of these periods. [2] Because the figures are rounded, the sum of the columns, in many cases, will not exactly add to the totals.

Source: Bureau of the Census, U. S. Department of Commerce.

(Exports to Europe, Asia and Africa will appear in the August issue)

domestic diluents. There is a demand for U. S. pesticides, but import permits are hard to come by.

Columbia. U. S. products hold a major share of the market. Competition from European countries, particularly West Germany, may increase, but U. S. products are favored and should maintain present share of market unless there is a substantial change in relative prices.

Argentine Imports of Pesticides, 1953

Commodity classification and principal countries of origin	Quantity (pounds)	Value (U. S. dollars)
Insecticides, liquid:		
United Kingdom	287,160	119,683
United States	552,411	171,235
Total	839,902	291,353
Insecticides, in powder form and general:		
Germany (probably Western)	10,648	85,532
United Kingdom	115,071	27,261
Total	132,873	115,924
Other insecticides and parasiticides in extract, liquid, paste, etc.:		
Germany	118,951	61,539
Italy	505,303	234,723
United Kingdom	961,717	350,933
United States	344,912	90,645
Total	1,941,642	744,457
Grand total	2,914,417	1,151,734

Source: Argentine official trade statistics.

Ecuador. An effective means of promoting sales is by sending qualified U. S. technicians to advise in the use of products and equipment and to train agronomists. European firms are using this method more than U. S. companies. Rapid service is also fundamental in improving the competitive U. S. position. They say it takes European delivery 1/6 of the time it takes U. S. orders to be delivered.

Paraguay. U. S. firms might gain an immediate advantage in the pesticide market by advancing short-term credits and accepting payment in soft currencies. This is a new, although a small, pesticide market. U. S. firms could assure their position through technical aid and practical demonstrations, distribution of simple, low-cost equipment and instructional literature.

Peru. Prospects are good for a continuing large or increased participation of U. S. pesticides in this market. Requirements are steadily growing and local preference is for U. S. products. Imports of calcium arsenate are expected to decline, but the U. S. is expected to supply most of Peru's increasing needs for sulfur, new organic pesticides, weedkillers and oil emulsions.

Uruguay. Best opportunities here appear to depend upon greater dollar-exchange availability, or in branch plants.

Venezuela. The U. S. now has 75 per cent of the pesticide market. New and better pesticides are welcome. U. S. suppliers would gain an advantage through financing agents to enable them to carry adequate stocks of pesticides. ▲

(to be concluded)

United States Production and Imports of Principal Pesticide Materials, 1945-55

(Thousands of pounds)

Commodity	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955 (preliminary)
PRODUCTION											
White arsenic	48,698	31,006	37,510	37,278	25,590	26,546	32,380	31,346	21,746	26,334	n. a.
Calcium arsenate	25,644	35,394	46,904	27,234	16,006	45,348	40,900	7,634	7,260	2,758	3,030
Lead arsenate	70,522	56,667	31,006	24,630	16,866	39,434	25,416	14,286	14,196	15,620	14,776
Copper sulfate	251,000	255,600	178,200	193,400	158,000	174,600	213,872	189,072	145,888	130,616	156,176
BHC (100% gamma basis)	n. a.	n. a.	n. a.	2,212	3,787	10,200	17,100	12,800	8,800	11,500	10,161
DDT (100% basis)	33,243	45,651	49,600	20,240	43,700	78,150	106,140	99,929	84,366	97,198	125,134
Parathion	n. a.	n. a.	n. a.	n. a.	n. a.	[1]2,625	4,631	2,365	2,999	3,899	5,000
TEPP (tetraethyl pyrophosphate)	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.	1,870	922	229	361	n. a.
2,4-D acid	917	5,466	5,629	21,889	15,106	14,156	17,671	30,718	25,928	30,134	34,070
2,4,5-T acid	n. a.	n. a.	n. a.	n. a.	n. a.	n. a.	[1]2,454	3,490	5,281	2,697	3,000
Miscellaneous organic pesticides[2]	n. a.	n. a.	n. a.	n. a.	n. a.	45,000	75,000	65,000	50,000	65,000	110,000
IMPORTS											
Pyrethrum flowers	18,270	20,476	8,082	3,633	10,160	8,268	6,902	6,878	7,850	6,883	8,000
Rotenone-bearing roots	8,820	11,369	13,413	4,713	7,716	10,010	6,263	2,853	5,643	6,325	5,400
White arsenic	26,298	27,606	27,880	18,672	9,393	29,547	29,037	8,967	9,434	9,696	14,430

n. a. Not available. [1] Partly estimated. [2] Includes such commodities as allethrin, aramite, aldrin, chlordane, dieldrin, dithiocarbamate fungicides, lindane, methoxychlor, malathion, toxaphene, endrin, captan, etc.

Sources: Bureau of the Census, U. S. Department of Commerce; Bureau of Mines, U. S. Department of the Interior; U. S. Tariff Commission; and (for miscellaneous organic pesticides) material in Chemical and Rubber Division files.

1954-55 Fertilizer Consumption In the United States

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FOR the year ended June 30, 1955, the consumption of fertilizers in the United States and territories amounted to 22,723,705 tons, a decrease of 49,794 tons (0.22 per cent) from consumption in 1953-54. This quantity comprised 21,943,397 tons of products containing one or more of the primary nutrients (N, P_2O_5, K_2O) and 780,308 tons of the secondary and trace element materials which did not contain primary nutrients. The total consumption of products containing primary nutrients was 214,589 tons (0.97 per cent) less than that in 1953-54 while the consumption of products that did not contain primary nutrients was 164,795 tons (26.77 per cent) more than that in 1953-54.

Although the total tonnage of primary nutrient products used in 1954-55 was lower than in 1953-54, the continued trend toward higher analysis products resulted in a greater consumption of primary nutrients.

The total use of these nutrients set a new record for the sixteenth consecutive year and amounted to 6,119,841 tons. Thus their consumption was 224,283 tons (3.80 per cent) over that in the preceding year.

The consumption of nitrogen increased 113,120 tons (6.12 per cent) to 1,960,536 tons, that of available P_2O_5 49,814 tons (2.23 per cent) to 2,284,362 tons and that of K_2O 61,349 tons (3.38 per cent) to 1,874,943 tons.

The consumption of total P_2O_5 decreased 41,870 tons (1.59 per cent) to 2,597,549 tons, owing principally to the decrease in use of phosphate rock which is estimated to have contained an average of 32 per cent of total P_2O_5 but only 3 per cent of available P_2O_5.

The average primary nutrient content of fertilizers bearing primary nutrients was 27.89 per cent in 1954-55 as compared with 26.61 per cent for the preceding year.

The data presented herein were compiled from manufacturers' reports of shipments to agents, dealers, distributors, and consumers in the territories (except Alaska), the District of Columbia, and the states (except California, Florida, Massachusetts, Missouri, North Carolina, South Carolina and Texas). For the latter seven states the data were compiled chiefly from the reports of the respective fertilizer control officials. No data were available for Alaska. Supplementary information was furnished by the control offices and other state agencies, as well as by fertilizer brokers, and special inquiries were made of all known distributors and custom applicators of anhydrous ammonia and nitrogen solutions.

For the first time, this annual report includes the separate tonnages, by states, of anhydrous ammonia, ammonium nitrate-limestone mixtures, nitrogen solutions (including aqua ammonia) and urea. Heretofore the regional distribution of these products (except ammonia and urea) was reported. Only the total tonnage of anhydrous ammonia was shown in the preceding annual reports while the tonnage of urea was included in "other chemical nitrogen materials."

The quantities are reported as 2,000-pound tons. Although the data refer to shipments, the terms "consumption," "sales" and "shipments" are used synonymously. The actual consumption differs slightly, no doubt, from either the shipments or sales.

All Fertilizers

The consumption of the two classes of fertilizers, mixtures and materials, is summarized by states and regions in Table 1. Regional gains in the consumption of all fertilizers occurred in the New England, Middle Atlantic, Mountain, and Pacific regions and the territories. Total use in these areas was 473,994 tons greater than in 1953-54. More than one-half of the gain was in California. The South Atlantic and the four Central Regions showed a combined decrease of 523,788 tons; of which more than one-half was in Illinois.

Consumption in each of 27 states, the District of Columbia, and both the territories, representing 44.18 per cent of the total tonnage in 1954-55 in the United States, was higher than that of the preceding year.

Compared with the tonnages for each six-month period of 1953-54, most of the increase in total consumption of all fertilizers in 1954-55 occurred in the July-

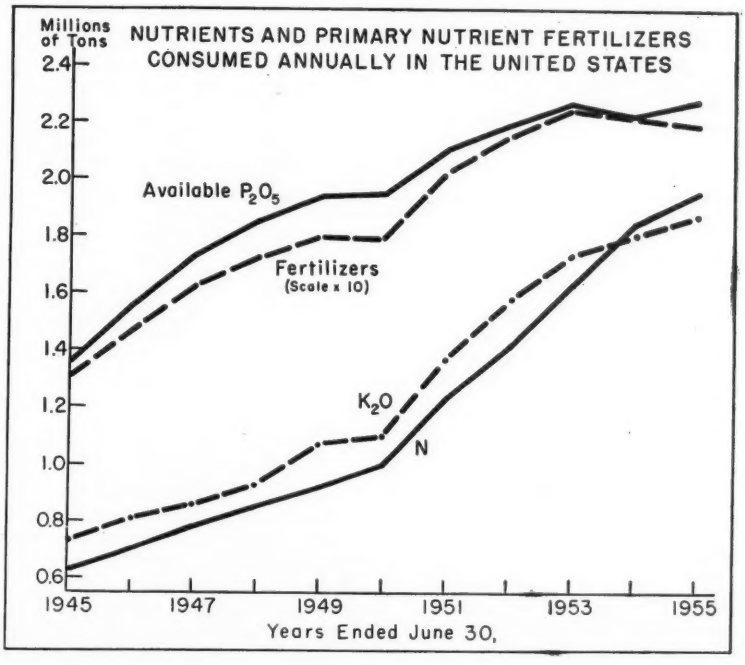

Table 1. - Consumption of Fertilizers, Year Ended June 30, 1955[1]

State & Region	Mixtures			Materials[2]			All Fertilizers 1954-55	Relative Consumption 1953-54 = 100	
	July 1 - Dec. 31, 1954	Jan. 1 - June 30, 1955	Total	July 1 - Dec. 31, 1954	Jan. 1 - June 30, 1955	Total		Fertilizers [3]	Total N, Avail. P_2O_5 & K_2O
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Percent	Percent
Maine	18,456	156,555	176,011	2,116	5,185	7,301	182,312	106	110
New Hampshire	1,602	12,240	13,842	1,024	3,577	4,601	18,443	116	122
Vermont	2,859	27,817	30,676	12,248	5,565	17,813	48,489	126	122
Massachusetts	10,343	57,673	68,016	5,407	11,932	17,339	85,355	100	106
Rhode Island	1,643	12,958	14,601	533	1,424	1,957	16,558	107	115
Connecticut	6,662	56,253	62,915	3,090	22,476	25,566	88,481	98	99
New England	41,565	323,496	365,061	24,418	50,159	74,577	439,638	106	109
New York	102,568	441,598	544,166	26,202	59,935	86,137	630,303	103	107
New Jersey	47,062	213,631	260,693	7,324	18,319	25,643	286,336	98	99
Pennsylvania	181,834	448,216	630,050	23,405	61,163	84,568	714,618	105	109
Delaware	13,358	77,081	90,439	912	4,284	5,196	95,635	101	102
District of Columbia	790	1,293	2,083	374	368	742	2,825	105	99
Maryland	74,166	223,852	298,018	4,859	14,726	19,585	317,603	102	104
West Virginia	11,766	61,668	73,434	1,802	6,498	8,300	81,734	106	111
Middle Atlantic	431,544	1,467,339	1,898,883	64,878	165,293	230,171	2,129,054	103	106
Virginia	145,929	552,060	697,979	24,431	94,844	119,275	817,254	102	104
North Carolina	234,164	1,248,382	1,482,536	47,092	299,025	346,117	1,828,653	99	102
South Carolina	94,863	550,192	645,055	37,748	246,422	284,170	929,225	99	99
Georgia	178,514	818,210	996,724	52,086	227,204	279,290	1,276,014	93	98
Florida	436,161	670,792	1,105,943	52,522	70,940	123,462	1,229,405	104	106
South Atlantic	1,088,611	3,839,626	4,928,237	213,879	938,435	1,152,314	6,080,551	99	102
Ohio	276,075	737,113	1,013,188	23,275	48,875	72,150	1,085,338	99	107
Indiana	221,171	769,479	990,650	34,438	127,602	162,040	1,152,690	98	107
Illinois	147,385	388,084	535,469	310,697	364,434	675,131	1,210,600	80	90
Michigan	165,092	420,088	585,180	14,647	38,768	53,415	638,595	106	114
Wisconsin	74,704	322,454	397,158	9,115	23,730	32,845	430,003	97	104
East North Central	884,427	2,637,218	3,521,645	392,172	603,409	995,581	4,517,226	94	103
Minnesota	44,018	234,417	278,435	21,072	73,164	94,236	372,671	115	124
Iowa	75,868	292,310	368,178	69,532	147,342	216,874	585,052	90	98
Missouri	187,908	267,709	455,617	83,492	143,804	227,296	682,913	80	95
North Dakota	3,088	20,598	23,686	11,827	27,497	39,324	63,010	132	136
South Dakota	2,370	13,768	16,138	5,004	16,759	21,763	37,901	126	132
Nebraska	9,198	38,794	47,992	43,843	116,378	160,221	208,213	105	106
Kansas	58,889	35,460	94,349	76,566	63,624	140,190	234,539	109	112
West North Central	381,339	903,056	1,284,395	311,336	588,568	899,904	2,184,299	98	105
Kentucky	62,243	352,632	414,875	28,741	79,102	107,843	522,718	90	94
Tennessee	112,710	296,836	409,546	43,758	78,507	122,265	531,811	102	106
Alabama	198,959	663,584	862,543	85,049	212,214	297,263	1,159,806	98	101
Mississippi	19,497	306,385	325,882	151,297	244,475	395,772	721,654	98	98
East South Central	393,409	1,619,437	2,012,846	308,845	614,298	923,143	2,935,989	97	100
Arkansas	29,490	126,808	156,298	41,436	135,073	176,509	332,807	90	95
Louisiana	34,278	137,853	172,131	46,159	102,469	148,628	320,759	101	104
Oklahoma	28,689	40,524	69,213	32,256	25,478	57,734	126,947	87	98
Texas	99,580	210,960	310,540	112,901	162,898	275,799	586,339	105	113
West South Central	192,037	516,145	708,182	232,752	425,918	658,670	1,366,852	98	104
Montana	403	2,605	3,008	6,055	14,623	20,678	23,686	82	85
Idaho	927	4,495	5,422	30,695	70,296	100,991	106,413	121	114
Wyoming	60	1,946	2,006	1,332	7,757	9,089	11,095	102	108
Colorado	3,635	9,818	13,453	9,856	25,423	35,279	48,732	104	101
New Mexico	522	1,608	2,130	7,124	23,330	30,454	32,584	146	157
Arizona	6,461	14,488	20,949	51,423	99,563	150,986	171,935	113	108
Utah	262	3,383	3,645	3,614	20,604	24,218	27,863	98	110
Nevada	230	456	686	1,011	1,484	2,495	3,181	83	83
Mountain	12,500	38,799	51,299	111,110	263,080	374,190	425,489	111	109
Washington	5,602	29,481	35,083	58,648	105,085	163,733	198,816	99	116
Oregon	3,922	18,373	22,295	46,779	103,174	149,953	172,248	117	118
California	81,242	159,019	240,261	672,667	920,885	1,593,552	1,833,813	110	109
Pacific	90,766	206,873	297,639	778,094	1,129,144	1,907,238	2,204,877	112	111
Continental U. S.	3,616,198	11,551,989	15,068,187	2,437,484	4,778,304	7,215,788	22,283,975	99	104
Hawaii	31,282	30,317	61,599	38,568	56,367	94,935	156,534	110	106
Puerto Rico	74,418	143,646	218,064	22,880	42,252	65,132	283,196	104	106
Alaska[4]	---	---	---	---	---	---	---	---	---
Territories	105,700	173,963	279,663	61,448	98,619	160,067	439,730	106	106
Total: 1954-55	3,621,898	11,725,952	15,347,850	2,498,932	4,876,923	7,375,855	22,723,705	99	104
1953-54	3,370,022	12,171,054	15,541,076	2,603,399	4,629,024	7,232,423	22,773,499	100	100
1952-53	3,687,360	12,034,864	15,722,224	3,067,991	4,622,393	7,690,384	23,412,608	102	96

1/ Includes: Ground phosphate rock, basic slag, secondary and trace element materials, such as, borax, sulfur, manganese sulfate, etc., used as separate materials, also fertilizers distributed by Government agencies. Does not include liming materials, but includes gypsum.

2/ Excludes the quantities of materials used for manufacture of commercial mixtures.

3/ Fertilizers which were guaranteed to contain primary plant nutrients (N, P_2O_5, K_2O).

4/ Not available: Consumption of all fertilizers in 1952-53 amounted to 653 tons.

Table 2. - Consumption of Principal Mixed Fertilizers in the Continental United States, By Grades, Year Ended June 30, 1954 and 1955

Grade	Consumption 1/		Proportion of Total	
	1953-54	1954-55	1953-54	1954-55
	Tons	Tons	Percent	Percent
0-8-24	5,448	5,115	0.04	0.03
0-9-27	15,510	16,886	.10	.11
0-10-10	4,367	2,956	.03	.02
0-10-20	49,130	56,696	.32	.37
0-10-30	48,006	45,606	.30	.30
0-10-40	3,749	3,226	.02	.02
0-12-12	66,343	28,720	.43	.19
0-12-20	20,121	11,983	.13	.08
0-12-24	2,978	2,791	.02	.02
0-12-36	8,564	7,691	.06	.05
0-14-6	4,611	3,296	.03	.02
0-14-7	32,590	7,047	.21	.05
0-14-10	8,200	5,108	.05	.03
0-14-14	177,499	129,982	1.16	.86
0-15-30	17,998	16,380	.12	.11
0-15-45	332	3,164	(2/)	.02
0-16-8	12,881	16,190	.08	.11
0-20-10	22,906	16,079	.15	.11
0-20-20	343,182	341,795	2.25	2.27
0-24-24	924	7,522	.01	.05
0-25-25	20	10,333	(2/)	.07
0-30-15	5,525	9,256	.04	.06
0-30-30	11,065	18,623	.07	.12
2-10-8	6,044	6,173	.05	.04
2-12-6	81,034	44,391	.53	.29
2-12-12	404,036	438,393	2.65	2.91
3-8-5	4,302	2,813	.03	.02
3-8-8	12,743	12,084	.08	.08
3-9-6	466,266	494,806	3.06	3.28
3-9-9	489,259	494,438	3.21	3.28
3-9-12	28,981	28,624	.19	.19
3-9-15	9,308	11,291	.06	.07
3-9-18	113,702	80,324	.75	.53
3-9-27	123,964	109,448	.81	.73
3-10-10	6,209	4,822	.04	.03
3-12-6	278,396	210,639	1.82	1.40
3-12-12	1,730,944	1,413,525	11.34	9.38
3-18-9	72,765	60,074	.48	.33
4-4-2	50	3,013	(2/)	.02
4-6-6	15,583	11,965	.10	.08
4-6-8	48,399	43,472	.32	.29
4-7-5	130,530	117,706	.86	.78
4-8-4	13,987	12,799	.09	.08
4-8-6	320,689	248,738	2.10	1.65
4-8-8	393,334	280,887	2.58	1.86
4-8-10	87,500	97,526	.57	.65
4-8-12	51,841	56,599	.34	.37
4-9-3	75,442	69,566	.50	.46
4-10-6	498,719	424,671	3.27	2.82
4-10-7	552,416	640,994	3.62	4.26
4-10-10	9,613	8,649	.06	.06
4-12-4	142,517	104,024	.93	.69
4-12-8	152,806	149,971	1.00	1.00
4-12-12	370,014	501,692	2.43	3.33
4-12-16	2,651	3,614	.02	.02
4-16-8	52,456	30,901	.34	.21
4-16-16	698,177	702,786	4.58	4.66
4-24-12	55,070	38,088	.36	.25
5-5-2	1,775	3,076	.01	.02
5-5-6	3,640	3,802	.02	.03
5-5-5	2,564	6,912	.02	.05
5-5-8	8,208	6,551	.05	.04
5-6-6	2,702	3,535	.02	.02
5-6-8	7,364	12,764	.05	.08
5-7-6	24,068	21,400	.16	.14
5-8-7	16,840	14,311	.11	.10
5-8-8	4,630	3,653	.03	.02
5-10-5	821,116	764,044	5.38	5.07
5-10-10	1,287,746	1,379,783	8.44	9.16
5-10-15	89,404	111,158	.59	.74
5-10-20	7,619	8,761	.05	.06
5-15-10	10,040	7,718	.07	.05
5-15-15	17,319	18,010	.11	.12
5-15-30	4,747	5,310	.03	.04
5-20-10	44,710	55,880	.29	.37
5-20-20	300,808	564,263	1.97	3.74
6-3-6	26,162	23,416	.17	.16
6-4-6	11,047	15,292	.07	.10
6-4-8	21,204	38,744	.14	.26
6-6-6	81,097	77,092	.53	.51
6-6-8	14,169	16,469	.09	.11
6-6-9	462	2,826	(2/)	.02
6-6-12	11,869	11,492	.08	.08
6-6-18	11,874	13,616	.08	.09
6-7-7	5,672	4,767	.04	.03
6-8-2	3,929	2,938	.03	.02
6-8-4	168,852	123,436	1.11	.82
6-8-6	195,320	169,826	1.28	1.08
6-8-8	268,134	264,922	1.89	1.76
6-8-12	40,244	23,125	.26	.15
6-9-3	5,534	5,708	.04	.04
6-9-6	11,053	8,963	.07	.06
6-9-9	8,271	6,329	.05	.04
6-9-12	54,609	51,089	.36	.34
6-9-27	3,035	2,763	.02	.02
6-10-4	57,216	71,996	.37	.48
6-10-5	2,064	3,639	.01	.02
6-12-4	3,385	3,278	.02	.02
6-12-6	51,806	51,456	.34	.34
6-12-12	186,274	280,573	1.21	1.86
6-20-20	4,633	4,501	.03	.03
6-24-0	21,556	13,397	.14	.09
6-24-12	43,087	65,377	.28	.43
6-24-24	13,386	22,433	.09	.15
6-36-0	556	3,145	(2/)	.02
7-7-7	36,428	29,851	.24	.20
7-8-8	3,183	5,706	.02	.04
7-9-9	2,546	3,566	.02	.02
7-14-7	3,614	2,733	.02	.02
8-8-8	16,084	16,007	.11	.11
8-0-12	6,625	6,485	.04	.04
8-0-24	20,088	20,395	.13	.14
8-2-8	269	2,998	(2/)	.02
8-4-8	37,279	41,929	.24	.28
8-5-7	18	3,237	(2/)	.02
8-6-4	5,443	5,812	.04	.04
8-6-6	3,339	4,159	.02	.03
8-6-8	7,545	3,721	.05	.02
8-6-9	0	3,200	.00	.02
8-6-12	281	3,134	(2/)	.02
8-8-4	20,037	19,035	.13	.13
8-8-8	254,471	226,634	1.67	1.50
8-9-10	5,876	7,641	.04	.05
8-10-12	11,742	11,976	.08	.08
8-12-2	0	3,140	.00	.02
8-12-12	27,833	39,478	.18	.26
8-12-16	17,021	17,501	.11	.12
8-16-8	7,062	5,860	.05	.04
8-16-16	94,762	126,175	.62	.84
8-24-8	101,509	85,837	.66	.57
8-24-12	6,583	9,418	.04	.06
8-32-0	72,176	63,110	.47	.42
9-6-6	6,921	10,089	.05	.07
9-6-9	2	3,650	(2/)	.02
9-9-9	2,295	3,579	.02	.03
9-36-0	2,522	3,324	.02	.02
10-0-10	44,797	29,688	.29	.20
10-0-12	2,539	4,714	.02	.03
10-4-10	5,687	3,763	.04	.02
10-5-5	2,659	3,067	.02	.02
10-5-10	640	4,262	(2/)	.03
10-6-4	35,258	40,540	.23	.27
10-6-10	379	3,210	(2/)	.02
10-10-0	8,007	8,705	.05	.06
10-10-5	30,971	23,529	.20	.16
10-10-10	701,365	725,133	4.60	4.91
10-15-15	2,893	4,824	.02	.03
10-16-8	9,948	7,661	.07	.05
10-20-0	117,049	102,526	.77	.68
10-20-5	2,206	2,806	.01	.02
10-20-10	48,714	86,642	.32	.58
10-20-20	9,088	15,143	.06	.10
10-30-10	3,624	5,211	.02	.03
11-8-4	20	3,131	(2/)	.02
12-0-8	2,094	3,276	.01	.02
12-0-10	14,146	19,820	.09	.13
12-0-12	5,148	5,966	.03	.04
12-0-16	259	3,780	(2/)	.02
12-5-6	3,583	5,683	.02	.04
12-12-6	3,768	3,704	.02	.03
12-12-12	208,922	306,858	1.37	2.04
12-24-0	11,743	8,272	.08	.06
12-24-12	31,354	27,327	.21	.18
13-13-13	24,136	31,459	.16	.21
14-0-14	38,892	46,804	.25	.31
14-14-14	2,852	33,782	.02	.22
15-0-12	4,437	3,549	.03	.02
15-0-15	1,021	4,043	.01	.03
15-5-5	8,451	6,731	.06	.05
15-15-0	58,402	55,637	.38	.37
15-20-0	2,082	2,706	.01	.02
15-30-0	0	2,988	.00	.02
16-8-8	610	3,313	(2/)	.02
16-10-0	6,558	7,776	.04	.05
17-7-0	19,706	17,815	.13	.12
20-0-20	4,447	7,399	.03	.05
176 Grades	14,786,109	14,558,704	96.71	96.62
Other specified grades	378,404	3/ 381,336	2.48	2.53
Grades not specified	123,540	128,147	.81	0.85
Total 4/	15,288,053	15,068,187	100.00	100.00

1/ Grades consumed in amounts of 2,700 tons or more in 1954-55 and their consumption in 1953-54. This accounts for differences in the 1953-54 sub-totals which as originally reported consisted of grades consumed in amounts of 2,500 tons or more. 2/ Less than 0.005 percent. 3/ 1,462 grades. 4/ Does not include the quantity of mixtures consumed in the Territories.

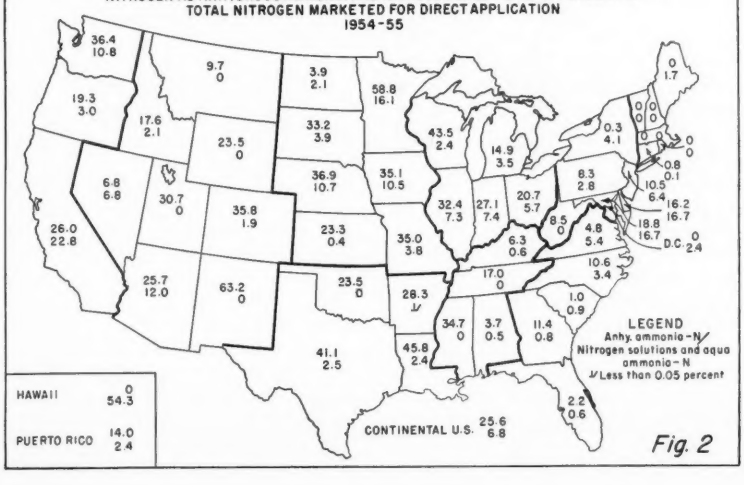

Fig. 2

December period. Consumption for this period in 1954-55 was 147,409 tons (2.47 per cent) above that for the corresponding period of 1953-54, while for the January-June period consumption was 197,203 tons (1.17 per cent) below the quantity for the same period of 1953-54.

In Table 1, the percentage change in consumption of fertilizers in 1954-55 as compared with 1953-54 is based on the tonnage of primary nutrient fertilizers only, in order that a direct comparison may be made with the percentage change in consumption of the primary nutrients themselves.

Regional distribution of the consumption of fertilizer between mixtures and materials in 1953-54 and 1954-55 is shown in Table 1a, as percentages of the country totals.

Mixtures

Mixed fertilizers consumed in the United States and territories amounted to 15,347,850 tons, as compared with 15,541,076 tons in 1953-54. The quantity of mixtures comprised 67.54 per cent of the total fertilizer tonnage in 1954-55, as compared with an average of 67.28 per cent for the preceding five-year period. In 1954-55, there were 1,750 grades designated by their guaranteed analyses, an increase of 431 over those so designated in 1953-54. This difference is largely the result of the more complete reporting of mixtures by specified grades in 1954-55 than in 1953-54. Among the individual states, the total number of grades designated by their guaranteed analysis ranged from 21 for New Mexico to 849 for Florida.

Consumption of individual grades of mixtures in total quantities of 2,700 tons or more in the Continental United States is shown in Table 2. In 1954-55, there were 176 of these grades totaling 14,558,704 tons and accounting for 96.62 per cent of the total quantity of mixtures. Other designated grades numbered 1,462, totaling 381,336 tons and accounted for 2.53 per cent of the quantity of mixtures. The balance of 128,147 tons (0.85 per cent) were reported under unspecified designations.

Consumption of mixtures in Hawaii and Puerto Rico totaled 279,663 tons in 164 grades (all specified). While many of the grades in Puerto Rico are similar to those used on the Continent, most of those in Hawaii are designated in fractional numbers.

The tonnages of the 15 grades most used in the Continental United States are shown in Table 2a. These grades accounted for 60 per cent or more of the total tonnage of mixtures consumed in the Continental United States in both 1953-54 and 1954-55. Grades 3-12-12, 5-10-10, 5-10-5, 10-10-10 and 4-16-16 were the grades consumed in largest tonnage in both years, in the order named.

Table 1a—Regional Percentage Distribution of Consumption of Fertilizer Mixtures and Materials

Region	Mixtures		Materials[1]	
	1953–54	1954–55	1953–54	1954–55
New England	2.26	2.37	0.89	1.01
Middle Atlantic	11.83	12.38	3.19	3.12
South Atlantic	32.31	32.11	15.50	15.62
East North Central	23.30	22.94	16.62	13.50
West North Central	8.64	8.37	12.18	12.20
East South Central	13.13	13.12	13.61	12.51
West South Central	4.59	4.61	9.42	8.93
Mountain	0.36	0.33	4.66	5.08
Pacific	1.75	1.94	22.15	25.85
Territories	1.83	1.83	1.78	2.18
United States	100.00	100.00	100.00	100.00

[1] Includes the secondary and trace element materials.

Table 2a—Fifteen Principal Grades of Mixed Fertilizers Consumed in Continental United States, Year Ended June 30, 1955, Compared with June 30, 1954

Grade	Consumption		Proportion of Total Consumption of Mixtures in Continental United States	
	1953–54	1954–55	1953–54	1954–55
	Tons	Tons	Per cent	Per cent
3-12-12	1,730,944	1,413,525	11.34	9.38
5-10-10	1,287,746	1,379,753	8.44	9.16
5-10-5	821,116	764,044	5.38	5.07
10-10-10	701,365	725,133	4.60	4.81
4-16-16	698,177	702,756	4.58	4.66
4-10-7	552,416	640,994	3.62	4.26
5-20-20	300,808	564,263	1.97	3.74
4-12-12	370,014	501,692	2.43	3.33
3-9-6	608,256	494,506	3.99	3.28
3-9-9	489,239	494,438	3.21	3.28
2-12-12	404,036	438,393	2.65	2.91
4-10-6	498,719	424,671	3.27	2.82
0-20-20	343,162	341,795	2.25	2.27
12-12-12	208,922	306,858	1.37	2.04
4-8-8	393,334	280,857	2.58	1.86
Total	9,408,254	9,473,678	61.68	62.87

The tonnages of the 15 principal grades consumed in each of the continental regions and Puerto Rico in 1954-55 are shown in Table 3, together with the quantities for each state in the region. Excepting California, Washington, Wyoming and the District of Columbia, these grades accounted for 50 per cent or more of the consumption of mixtures in each of the states and Puerto Rico.

The consumption of mixtures by classes (N-P-K, N-P, P-K, N-K) for each region and the United States is shown in Table 5. Except for the Mountain region, N-P-K mixtures were favored over the other classes. More than 76 per cent of the tonnage of all mixtures consumed in each of the other regions was of this class, while in the Mountain region consumption of N-P-K and N-P mixtures were nearly equally divided. For the United States, 91.04 per cent of the tonnage of all mixtures was of the N-P-K class, while for the other classes—N-P, P-K, N-K—consumption was 2.26 per cent, 5.25 per cent and 1.45 per cent of the total tonnage, respectively.

The national weighted average of total primary nutrients contained in mixtures increased from 26.87 per cent in 1953-54 to 27.90 per cent in 1954-55 (Table 7). The average, for 1954-55, comprised nitrogen, 5.24; available P_2O_5, 11.86 and K_2O, 10.80 per cent. The average percentages of these nutrients in 1953-54 were 5.01, 11.54 (revised) and 10.32 (revised), respectively. As compared with 1953-54, the increases in these averages were 4.59 per cent for nitrogen, 2.77 per cent for available P_2O_5 and 4.65 per cent for K_2O.

The average primary nutrient content of all mixtures consumed in each state and territory is shown in Table 7. These averages for the 51 political units showed for nitrogen, increases or no change in 39 and decreases in 12; for available P_2O_5, increases in 36 and decreases in 15; for K_2O, increases in 44 and decreases in 7 and for total primary nutrients, increases in 44 and decreases in 7.

Materials

The consumption of fertilizer materials for direct application amounted to 7,375,855 tons in 1954-55 as compared with 7,232,423 tons in 1953-54. The quantity, in 1954-55, comprised chemical nitrogen materials 3,500,167 tons, phosphate materials (including ammonium phosphates, 11–48, 13–39, ammonium phosphate-sulfate as well as all mixtures reported as the 16-20-0 grade) 2,233,196 tons, natural organic materials 461,100 tons, potash materials (including potassium nitrate, potassium-sodium nitrate and lime-potash) 401,084 tons and secondary and trace element materials 780,308 tons.

Compared with 1953-54 there was an increase of 239,764 tons in chemical nitrogen materials, 41,032 tons in natural organics materials, 9,521 tons in potash materials and 164,795 tons in secondary and trace element materials. Consumption of all phosphate materials was 311,690 tons below that in 1953-54. The consumption of the principal materials comprising these classes is shown by states and regions in Tables 4 and 5.

In chemical nitrogen materials the principal changes from the previous year were increases in consumption of ammonium nitrate (from 924,736 to 1,115,358 tons) and nitrogen solutions including aqua ammonia (from 191,592 to 340,574 tons). In Table 5, the consumption of aqua ammonia is reported separately for the first time. The increasing use of this product on the west coast and in the territories was the principal reason for the higher tonnage of all nitrogen solutions reported in 1954-55. Consumption of anhydrous ammonia was 3,207 tons more than that of 350,474 tons consumed in 1953-54. A comparison of the reports of distributors and applicators for both years, showed an average decrease of approximately 4 per cent in the marketing of this product. Sales by new distributors and applicators brought the total to 353,681 tons in 1954-55. Consumption of ammonium nitrate-lime-

stone mixtures, ammonium sulfate, and sodium nitrate were all below that of 1953-54. The use of urea, which is also shown separately for the first time, amounted to 68,585 tons.

Consumption of most of the natural organic materials, excepting dried manures and sewage sludge were approximately of the same magnitude as in the previous year. Dried manures increased from 259,868 tons to 288,458 tons and activated sewage sludge from 70,021 tons to 88,794 tons.

Although the tonnages of many of the phosphate materials consumed in 1954-55 were higher than that of the preceding year, the total tonnage for all of these products was below that in 1953-54 due to the relatively large decrease in the use of phosphate rock. The use of phosphate rock was lower in 32 of the 51 political units covered. Total consumption of this product was 583,097 tons compared with 876,375 tons in 1953-54.

The consumption of superphosphates grading 22 per cent and under was below that in 1953-54 in 30 of the political units. Consumption of these products was only 685,722 tons as compared with 786,927 tons in the preceding year. Consumption of superphosphates grading over 22 per cent amounted to 341,940 tons as compared with 247,142 tons in 1953-54. The combined tonnage of all superphosphates in 1954-55 was 1,027,-662 tons as compared with 1,034,069 tons in the preceding year but the available P_2O_5 content of these products in 1954-55 was 22,830 tons higher due to the increased use of higher analyses superphosphates.

The 60-per cent grade of potassium chloride was greatly favored over the 50-per cent grade; the respective consumption of these grades were 281,409 tons and 37,248 tons in 1954-55, as compared with 256,979 and 53,056 tons in 1953-54. Most of the other eight potassium products were consumed in lower amounts than in the preceding year.

The total consumption of calcium sulfate (gypsum) increased to 741,116 tons from 576,780 tons in the preceding year. The consumption in California alone increased from 414,067 to 615,815 tons.

The weighted average primary nutrient content of the principal classes of materials consumed is given in Table 7. These averages are based on the composition and tonnage of the individual

Table 5.- Consumption of Mixed Fertilizers, by Grades in Each State and Region, Year Ended June 30, 1955

State	Fifteen Principal Grades Consumed in Region, Tons															All Other Grades		Total Tons
																Number 1/	Tons	
New England																		
	5-10-10	6-8-12	8-12-12	8-16-16	6-3-6	10-10-10	8-12-16	4-8-7	0-20-20	7-7-7	8-8-10	0-16-20	5-10-5	6-8-6	6-8-8			
Maine	13,749	80,336	34,688	12,736	0	7,830	17,490	2,949	1,097	944	7,641	185	378	0	6,309	27	16,949	176,011
New Hampshire	5,896	0	342	3,739	0	1,280	0	864	908	633	0	1,040	97	0	0	24	1,836	15,942
Vermont	7,082	0	80	6,845	9	2,886	0	194	7,903	627	0	2,723	58	0	0	27	2,776	30,976
Massachusetts	19,411	0	766	4,627	6,987	6,088	0	6,991	1,082	8,018	0	734	2,780	1,829	0	23	15,809	68,016
Rhode Island	7,073	0	1,007	197	0	328	11	837	288	926	0	83	227	329	0	27	5,821	14,601
Connecticut	9,010	0	1,252	2,245	16,280	4,380	0	3,364	5,058	3,063	0	1,797	3,844	4,615	0	52	10,898	62,016
Total	62,221	80,336	38,136	29,447	23,276	22,908	17,501	14,189	16,336	14,211	7,641	7,527	7,384	6,773	6,309	68	80,810	365,061
Middle Atlantic																		
	5-10-10	5-10-5	5-12-6	10-10-10	8-16-16	0-20-20	6-12-6	4-8-12	6-12-12	4-12-12	2-12-12	8-8-8	0-14-14	5-12-12	5-10-15			
New York	163,612	139,372	13,617	62,882	26,391	12,875	36,542	8,976	16,870	9	44	5,042	1,761	2,997	13,089	76	42,947	546,166
New Jersey	141,666	25,368	2,990	8,945	1,849	2,967	1,730	422	2,797	85	106	16,586	3,198	1,817	833	64	50,096	260,698
Pennsylvania	273,963	31,171	97,656	56,856	18,992	27,168	2,185	9,805	6,196	23,458	6,890	5,865	8,980	11,529	2,886	68	80,892	650,060
Delaware	43,476	2,109	1,963	6,126	2,896	2,094	22	2,114	2,806	1,832	4,296	640	3,479	1,240	5,801	62	9,324	90,439
District of Columbia	14	990	20	2	0	0	0	10	8	0	0	16	0	0	0	13	1,128	2,083
Maryland	95,264	27,480	51,486	16,975	4,141	6,822	0	16,942	2,425	6,368	16,170	2,286	7,236	7,872	1,017	79	40,980	298,018
West Virginia	30,012	3,236	16,258	3,065	209	4,648	0	0	894	76	2,812	17	2,074	396	38	38	11,206	75,494
Total	745,986	229,815	182,589	152,820	54,977	54,768	40,480	34,987	32,990	31,826	29,817	28,949	26,819	26,061	23,044	182	206,156	1,998,998
South Atlantic																		
	3-8-9	4-10-6	4-12-12	2-12-12	3-9-6	5-10-10	4-8-8	4-8-6	5-10-5	4-7-8	5-8-6	4-8-10	3-12-12	6-8-6	4-8-8			
Virginia	41,258	134	7,969	194,276	84,664	130,898	1	0	72,068	0	12,518	6,528	32	0	8,679	46	171,987	697,979
North Carolina	189,191	270,176	3,830	186,168	300,861	201,778	0	0	15,793	0	52,809	73,072	0	0	50,869	27	160,785	1,486,536
South Carolina	199,686	153,328	23,799	0	45,125	19,104	28,736	0	45,692	0	8,446	0	62,161	0	0	22	45,978	646,055
Georgia	85,878	182	349,122	30,087	3,157	10,281	186,217	203,979	8,290	40	29,829	0	1,447	0	8,823	97	108,887	996,724
Florida	7,227	252	14,169	3,908	10	4,447	76,382	44,619	8,124	117,666	6,066	17,847	2,250	76,813	7,197	854	720,887	1,105,943
Total	482,537	424,671	418,879	403,432	601,807	366,508	291,336	248,598	146,967	117,706	115,370	97,447	66,990	76,813	69,568	668	1,204,522	4,926,237
East North Central																		
	5-12-12	4-16-16	5-20-20	10-10-10	0-20-20	5-10-10	12-12-12	3-9-27	3-18-9	0-10-30	3-9-18	6-12-12	8-16-16	10-6-4	14-14-14			
Ohio	460,886	60,521	88,397	80,328	36,998	128,177	22,894	988	18,148	1,879	7,971	15,369	18,436	11,733	2,550	59	61,113	1,015,188
Indiana	251,967	287,115	106,173	129,755	59,444	4,785	30,815	31,858	7,659	14,598	5,947	5,750	2,224	1,106	10,672	79	40,846	990,650
Illinois	108,927	112,032	40,987	109,653	28,793	377	32,637	35,838	1,334	4,193	6,569	4,678	354	993	3,814	78	47,890	538,469
Michigan	179,813	119,860	81,326	39,326	21,746	7,740	62,987	2,727	24,463	4,051	7,071	8,078	877	6,427	0	63	42,978	586,180
Wisconsin	88,249	59,102	76,058	34,765	41,778	0	2,811	19,938	1,009	19,702	14,669	2,299	1,508	91	762	53	34,621	397,158
Total	1,090,832	638,630	392,941	389,827	188,759	141,079	151,942	91,058	49,613	44,390	40,327	36,974	23,199	20,350	17,598	332	227,448	3,521,645
West North Central																		
	5-20-20	12-12-12	10-10-10	8-24-8	5-12-12	10-20-0	6-24-12	8-32-0	0-20-20	4-16-16	5-20-10	4-12-4	15-15-0	6-8-8	4-24-12			
Minnesota	59,869	325	12,715	68	2,959	3,742	51,764	9,925	24,448	31,349	7,648	0	694	8	15,268	68	60,560	272,435
Iowa	99,712	25,884	34,689	1,428	18,717	27,160	2,806	21,157	12,629	14,966	41,414	158	11,791	50	161	170	69,199	368,178
Missouri	6,983	111,364	33,282	61,313	55,676	1,692	0	44	17,186	9,614	19	42,953	900	41,036	10,382	37	63,757	455,617
North Dakota	388	40	496	0	284	532	3,880	9,954	332	480	157	0	186	0	1,072	34	6,405	23,666
South Dakota	84	63	219	16	3	7,286	231	2,175	84	2	22	0	2,482	0	6	52	3,558	16,150
Nebraska	127	843	228	499	10	8,068	1	7,915	603	28	216	25	9,682	1	333	74	19,499	47,992
Kansas	280	1,673	1,187	17,827	688	24,490	33	6,755	402	138	43	4,715	13,820	315	353	34	15,530	84,549
Total	167,990	139,988	82,766	81,230	78,317	72,618	58,715	57,015	55,684	56,577	49,519	47,869	40,445	41,980	28,532	336	238,504	1,284,396
East South Central																		
	4-10-7	6-8-8	6-12-12	5-10-6	6-8-4	3-12-12	3-9-6	5-10-15	4-12-8	4-12-12	5-10-10	6-8-6	2-12-6	0-14-14	8-8-8			
Kentucky	0	961	10,033	1,610	2	62,715	22,932	70,590	52,296	244	23,517	36,844	34,169	1,172	6,065	65	89,926	414,674
Tennessee	823	4,403	168,217	4,496	2,576	29,066	69,930	6,893	8,278	1,861	16,949	1,290	2,464	279	4,968	86	80,069	439,546
Alabama	579,260	82,784	35	1,981	109,339	0	14	0	0	46,415	0	123	0	28,462	5,807	36	36,327	862,545
Mississippi	6,324	154,734	328	115,170	6,490	1,148	0	0	0	2	7,910	0	0	4,473	10,312	29	20,991	327,892
Total	586,407	232,882	178,611	121,257	118,407	92,929	92,876	77,483	60,572	50,520	47,376	40,057	36,622	34,386	27,149	141	238,313	2,044,846
West South Central																		
	5-10-5	10-20-10	6-8-8	3-12-12	4-12-4	12-12-12	6-8-12	12-24-12	10-30-0	3-9-18	15-13-13	6-8-8	5-10-10	6-10-4	15-15-0			
Arkansas	47,729	13,276	3,605	3,249	2,512	7,709	20,970	1,010	420	12,715	2,566	95	1,776	30	0	62	38,947	156,499
Louisiana	32,492	3,140	38,976	29,502	11,700	12,557	680	1,997	4	72	4,291	13,116	3,664	1,711	823	56	24,351	172,131
Oklahoma	28,376	9,856	529	930	5,884	331	3	2,894	4,894	1,017	330	78	2,018	845	216	46	13,406	69,213
Texas	138,141	35,387	20,352	10,883	10,787	3,093	532	12,800	13,072	45	6,629	181	5,555	7,245	7,649	98	40,809	310,540
Total	242,737	61,659	60,362	41,264	30,883	23,790	21,986	18,201	18,190	13,847	13,606	13,470	12,982	9,331	8,694	157	117,272	708,382
Mountain																		
	10-20-0	12-24-0	6-10-4	10-20-5	10-10-10	10-10-0	10-18-8	20-20-0	12-18-0	27-14-0	15-15-0	10-18-5	14-7-0	20-10-0	15-11-0			
Montana	1,783	0	211	0	0	0	0	0	0	0	0	213	0	0	0	20	821	3,008
Idaho	621	0	226	0	15	198	436	0	1,417	0	0	462	0	3	1,357	27	780	5,422
Wyoming	235	321	30	0	0	0	0	0	28	0	6	40	0	3	0	19	1,748	2,006
Colorado	332	2,956	726	0	814	0	1,101	87	0	0	218	622	0	24	0	56	6,896	13,453
New Mexico	286	0	119	0	28	75	4	0	0	0	810	0	216	0	0	14	614	2,130
Arizona	4,083	0	500	2,435	1,189	1,768	0	1,620	77	989	420	0	1,196	1,321	0	52	9,461	20,940
Utah	861	0	1,060	0	6	0	78	0	42	500	0	96	0	0	2	30	994	3,648
Nevada	127	0	233	0	1	0	0	0	0	0	0	0	0	0	0	20	325	686
Total	8,278	3,277	3,133	2,435	2,061	2,059	1,619	1,707	1,562	1,489	1,448	1,423	1,412	1,349	1,339	122	18,869	51,299
Pacific																		
	10-10-5	17-7-0	6-8-6	10-10-10	6-10-4	8-10-12	16-10-0	18-8-6	10-16-8	5-10-10	4-10-10	6-20-20	11-8-4	10-20-20	6-6-2			
Washington	487	0	0	836	4,159	0	0	0	294	4,382	0	2,306	0	2,581	0	96	20,089	35,082
Oregon	81	0	0	632	1,198	0	0	27	8,747	1,977	0	2,137	0	524	0	37	10,872	24,424
California	19,886	17,763	16,473	14,620	6,934	9,068	7,011	6,855	0	0	5,488	0	3,118	0	3,013	797	130,344	240,261
Total	20,453	17,763	16,473	16,088	12,291	9,068	7,011	6,882	6,041	6,359	5,488	4,443	3,118	3,065	3,013	882	161,005	297,639
Territories 2/																		
	16-4-10	16-7-8	15-4-7	12-6-10	12-4-10	8-6-10	13-3-12	6-8-10	12-3-16	10-10-8	10-8-14	10-10-5	9-10-6	16-4-6	12-2-10			
Puerto Rico	34,455	24,356	20,424	16,842	13,219	12,612	12,564	11,858	8,191	7,742	7,626	5,811	4,216	4,536	3,842	24	29,271	218,004

1/ The number of mixtures shown for each State and Region is exclusive of mixtures not specified by grade, although their tonnages are included in the totals.
2/ The total consumption in Hawaii was 61,689 tons of mixed goods, comprising 127 grades, which were manufactured to consumer's specifications. Data for Alaska not available. In 1952-53, the number of mixtures reported for Alaska were nine, totaling 136 tons.

materials comprising the several classes. For materials containing only nitrogen, P_2O_5, or K_2O, the respective national averages were 31.00, 19.32 (available P_2O_5), and 54.56 per cent, while the multiple-nutrient materials averaged 21.64 per cent. The corresponding averages for these classes in 1953-54 were 30.81, 15.70, 54.01 and 17.53 per cent. The national averages for all classes were higher than in 1953-54 reflecting the greater use of higher analysis products.

Primary Nutrients

The quantities of primary nutrients in fertilizers are based on the average analyses of samples of the various products as published by fertilizer control officials for the state in which they were consumed, rather than on the manufacturers' guarantees. Thus, the overruns or underruns of nutrients from the guarantees are taken into account. This gives more nearly the actual tonnages of nutrients than would be the case if only the guarantees were used. The actual nutrient content usually averages somewhat higher than the guarantee.

Fertilizers consumed in the United States and territories in 1954-55 contained 1,960,536 tons of nitrogen, 2,284,362 tons of available P_2O_5 (2,597,549 tons of total P_2O_5) and 1,874,943 tons of K_2O (Table 6). Compared with 1953-54, the quantities of these nutrients increased, for nitrogen, 113,120 tons (6.12 per cent), for available P_2O_5, 49,814 tons (2.23 per cent), for K_2O, 61,349 tons (3.38 per cent), while total P_2O_5 decreased 41,870 tons (1.59 per cent).

The annual consumption of primary nutrients in the United States and territories for the years 1944-45 through 1954-55 is shown in Figure 1. During the period from 1944-45 to 1949-50 the consumption of nitrogen increased at the rate of approximately 75,000 tons annually, whereas the annual rate of increase in subsequent years through 1953-54 was about 210,000 tons. The increase for the 1954-55 year was only 113,120 tons as compared with the above average since 1949-50. In general, the annual rate of increase of K_2O has about paralleled that of nitrogen from 1944-45 to 1949-50, but there has been a decreasing trend in the annual rate of increase since 1950-51. In both 1953-54 and 1954-55, the consumption of K_2O was lower than that of nitrogen. The increase in consumption of K_2O in 1954-55 over 1953-54 was only 61,349 tons, approximately one-half that of nitrogen. The trend in the annual rate of increase in the consumption of available P_2O_5 follows more closely the trend pattern of the consumption of primary nutrient fertilizers than either that of nitrogen or K_2O during this period. The average percentage content of P_2O_5 in fertilizers has remained about 10 per cent while that of

Table 4. - Principal Fertilizer Materials Consumed as Such, Year Ended June 30, 1955[1]

TONS

State & Region	Chemical Nitrogen Materials								Natural Organics [2]	Phosphate Materials[2]			Potash Materials		Total Primary Nutrient Materials	Secondary and Trace Element Materials[2]
	Ammonia (Anhydrous)	Ammonium Nitrate	Ammonium Nitrate-Limestone Mixtures	Ammonium Sulfate	Calcium Cyanamide	Nitrogen Solutions & Aqua Ammonia[3]	Sodium Nitrate	Urea	Other[2]		Phosphate Rock[3]	Superphosphates: Grades 22 Percent and Under	Superphosphates: Grades Over 22 Percent	Other	Chlorides 50-60 Percent Grades	Other[2]		
Maine	0	1,122	13	54	269	24	155	61	2	1,616	67	3,708	0	132	20	20	7,263	38
New Hampshire	0	939	2	28	50	0	160	3	6	697	2	2,488	4	85	78	28	4,568	33
Vermont	0	538	80	10	7	0	64	79	15	356	140	16,067	5	42	338	31	17,771	42
Massachusetts	0	1,721	19	90	222	0	1,015	68	10	2,557	258	4,585	0	664	466	21	17,214	125
Rhode Island	0	102	2	69	98	0	85	6	3	1,069	53	304	0	77	4	4	1,949	8
Connecticut	14	692	15	35	234	2	501	52	4	15,178	160	5,152	115	1,057	1,049	1,055	25,416	150
New England	14	4,611	131	285	880	26	2,066	311	40	27,465	680	32,304	124	2,057	2,028	1,159	74,181	396
New York	26	12,404	977	346	3,679	758	4,815	1,016	128	16,090	2,029	40,236	1,147	1,255	734	605	85,245	892
New Jersey	388	3,094	628	144	2,028	473	2,920	166	120	6,680	879	4,643	869	1,094	1,125	119	25,370	273
Pennsylvania	618	7,813	408	4,182	3,418	451	2,067	436	167	9,956	5,864	31,617	3,625	10,110	1,086	553	81,977	2,591
Delaware	238	1,715	285	6	577	545	128	28	0	648	52	525	1	130	152	0	5,078	121
District of Columbia	0	1	0	7	0	4	15	0	0	602	32	28	0	48	2	0	742	0
Maryland	659	1,830	602	144	1,820	1,260	3,578	186	15	1,611	1,810	5,062	70	662	281	295	19,355	230
West Virginia	84	1,116	186	296	8	0	1,436	40	8	480	151	4,234	61	82	103	1	8,285	15
Middle Atlantic	1,990	27,973	3,084	5,124	11,230	3,489	14,762	1,871	428	36,068	10,537	86,403	5,673	13,381	3,483	1,573	226,049	4,122
Virginia	814	6,088	26,217	79	1,915	2,393	26,822	86	617	1,311	2,689	9,717	65	1,271	2,007	16,044	98,085	21,190
North Carolina	7,420	10,719	114,335	172	9,519	7,064	122,172	404	0	2,343	1,457	18,783	170	6,418	10,681	6,015	315,462	27,685
South Carolina	662	22,324	92,311	571	1,652	1,878	101,627	106	0	636	1,560	20,905	4	9,035	22,065	6,969	281,134	3,036
Georgia	6,769	42,124	58,492	1,029	1,947	1,976	94,596	489	19	1,656	2,024	27,654	172	8,018	6,964	4,176	261,962	17,328
Florida	452	13,951	5,951	2,820	1,830	800	21,793	3,362	13,186	9,292	14,187	6,842	127	4,800	2,811	17,413	119,597	3,865
South Atlantic	15,997	96,176	297,306	4,670	16,863	15,701	369,010	4,927	13,822	16,237	21,677	83,901	538	29,340	46,538	50,537	1,079,240	73,074
Ohio	3,020	17,078	241	7,198	974	1,726	1,015	1,514	22	9,048	6,847	14,967	3,247	1,617	2,750	672	71,636	514
Indiana	10,638	51,372	575	5,645	1,492	6,261	165	4,188	122	3,816	18,386	8,434	13,657	1,986	34,080	522	161,592	446
Illinois	17,315	46,089	1,933	42,058	231	10,560	33	2,201	74	12,642	370,775	80,832	26,825	9,899	80,844	158	674,189	962
Michigan	1,589	12,612	152	6,267	228	858	444	1,572	358	13,225	3,180	9,137	994	1,213	708	444	52,946	469
Wisconsin	2,815	7,069	27	259	13	318	9	101	2	8,665	7,806	2,289	564	294	3,860	521	32,589	256
East North Central	35,377	134,220	2,928	61,407	2,938	19,720	1,666	9,576	578	45,396	406,937	85,659	47,287	15,009	122,217	2,617	992,952	2,649
Minnesota	15,474	10,808	170	1,967	0	8,457	0	87	3	5,536	2,729	7,298	28,610	10,991	2,243	1	93,962	274
Iowa	17,882	54,504	175	1,189	182	11,126	30	1,429	7	3,353	16,663	43,282	23,226	31,254	12,141	406	215,799	75
Missouri	14,978	58,326	3,450	1,650	67	3,476	140	803	202	3,805	105,307	5,287	6,806	5,774	17,080	358	227,208	88
North Dakota	134	579	0	67	0	141	0	34	0	64	40	127	19,555	18,408	52	0	59,221	153
South Dakota	1,695	4,680	2	188	0	394	0	269	1	426	60	707	7,302	6,046	13	0	21,763	0
Nebraska	22,788	60,904	180	644	0	13,815	0	2,069	0	4,084	3,471	4,619	24,688	14,826	213	0	159,833	388
Kansas	8,823	48,207	5	386	0	328	0	346	0	1,181	3,583	5,182	28,701	42,599	1,067	0	140,076	114
West North Central	81,452	245,508	3,982	5,961	249	37,735	170	4,727	215	18,249	131,853	66,480	138,861	129,898	32,799	765	898,862	1,042
Kentucky	796	26,219	149	308	1,647	224	1,667	214	7	447	6,997	33,167	2,737	14,738	10,146	8,229	127,691	152
Tennessee	4,573	42,721	444	194	3,119	0	16,146	1,062	0	1,035	694	18,241	5,689	14,794	13,966	4,375	122,043	222
Alabama	2,300	75,569	36,780	1,080	1,693	1,277	92,348	149	20	530	2,179	25,358	167	45,948	6,696	122	296,166	1,097
Mississippi	40,811	146,384	9,196	2,034	8,784	0	59,633	152	14	31	2,836	28,664	1,747	73,341	21,426	269	395,321	451
East South Central	48,479	290,883	46,568	3,616	15,243	1,501	169,774	1,577	41	2,043	12,706	100,430	10,310	148,821	54,234	12,995	921,221	1,922
Arkansas	15,026	65,578	747	8,479	9,062	24	24,633	2,641	62	189	287	8,748	8,368	2,428	29,751	635	176,502	7
Louisiana	23,787	41,279	1,239	7,072	3,826	4,116	30,003	744	491	524	1,790	19,899	1,044	7,667	5,571	39	148,461	187
Oklahoma	1,794	9,260	0	662	1	0	676	169	0	1,125	5,418	21,851	6,692	9,180	1,089	0	57,702	32
Texas	27,168	33,025	31	40,761	973	4,218	1,711	2,886	4	6,573	8,144	60,828	28,429	59,568	1,002	60	276,361	448
West South Central	67,735	149,132	2,017	56,964	13,552	8,358	56,982	6,340	557	8,409	15,637	110,826	44,530	78,850	37,415	734	658,016	654
Montana	225	3,030	0	1,164	0	0	0	61	0	125	0	176	12,446	3,010	24	0	20,253	425
Idaho	3,960	20,185	0	31,463	175	1,897	30	170	438	227	0	18,267	14,659	7,061	114	0	96,536	4,355
Wyoming	206	848	0	299	0	0	0	238	0	11	0	342	6,339	1,039	38	0	8,358	731
Colorado	2,436	7,038	87	2,812	4	827	0	586	0	761	35	720	13,926	5,203	200	204	34,701	578
New Mexico	4,552	1,832	0	896	0	0	5	1,600	0	1,109	0	5,666	10,743	4,177	47	30	30,454	0
Arizona	9,941	11,401	0	28,909	940	14,153	793	9,914	6,201	10,357	0	5,328	4,615	27,988	508	282	131,330	19,656
Utah	1,675	5,636	0	4,617	0	2	0	98	0	1,037	0	3,034	6,289	1,526	73	0	23,987	251
Nevada	10	8	0	254	0	40	9	8	0	84	0	52	407	245	2	1	1,118	1,377
Mountain	23,205	49,970	87	70,604	1,119	16,919	835	12,845	6,639	13,711	33	31,484	68,406	50,239	1,004	517	346,817	27,373
Washington	18,289	33,961	260	32,573	217	21,938	182	890	2,714	2,125	583	8,817	8,537	14,957	2,354	1,597	150,002	13,751
Oregon	7,069	28,769	0	42,168	580	3,327	33	1,672	4,343	926	64	11,568	2,720	26,386	1,419	3,653	152,677	17,276
California	51,818	57,135	0	163,025	6,051	169,699	221	16,644	29,811 [4]	292,376	2,401	61,474	14,541	68,023	1,268	4,520	967,867	635,685
Pacific	76,876	117,865	260	237,764	6,808	194,962	436	18,406	36,868	295,429	3,128	81,859	25,798	129,366	5,041	9,770	1,240,546	666,692
Continental U. S.	351,125	1,115,358	358,025	446,195	68,882	296,011	615,701	60,080	59,186	460,967	603,168	679,216	341,940 *	596,941	304,757	80,667	6,437,864	777,924
Hawaii	0	0	0	13,771	0	42,833	135	8,472	68	113	1,465	6,154	379	3,822	13,826	1,713	92,551	2,384
Puerto Rico	2,566	0	0	60,002	0	1,750	6	35	0	0	0	352	14	318	74	47	65,182	0
Alaska[5]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Territories	2,566	0	0	73,773	0	44,583	141	8,505	68	113	1,465	6,506	393	3,940	13,900	1,760	157,683	2,384
Total: 1954-55	353,681	1,115,358	358,025	519,968	68,882	340,874	615,842	68,585	59,254	461,100	604,653	685,722	341,547 †	600,881	318,657	82,427	6,595,547	780,308
1953-54	350,474	924,736	390,803	536,716	68,213	191,592	553,106	6/	144,964	420,068	912,676	786,927	247,142	598,141	309,735	81,816	6,616,910	616,515
1952-53	317,182	846,252	419,845	534,749	62,219	72,917	647,403	6/	166,652	349,087	1,176,962	1,046,827	240,850	636,996	282,485	74,461	6,812,897	677,487

1/ Includes materials distributed by Government agencies. Excludes lime and the quantities of materials used for manufacture of commercial mixtures. 2/ The principal commodities are shown in Table 5, by regions. 3/ Includes colloidal phosphate the quantity of which is shown separately, by regions, in Table 5. 4/ Includes an estimated 240,000 tons of dried manures. 5/ Not available. 6/ Withheld to avoid disclosing figures for individual establishments. *341,547 †341,940

Table 5. - Kinds of Fertilizers Consumed in Regions of the United States, During Year Ended June 30, 1956[1]

Tons

Kinds	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Territories [2]	Total
MIXTURES: N-P-K	339,510	1,800,743	4,862,714	3,228,363	982,410	1,906,719	642,566	23,273	244,320	249,369	13,972,007
N-P	7	93	1,247	6,811	217,240	96	41,110	27,906	50,080	3,726	347,297
P-K	25,844	97,944	176,637	287,309	84,612	103,359	24,486	121	1,684	3,641	805,337
N-K	0	103	197,639	152	133	670	0	0	2,575	22,927	223,209
CHEMICAL NITROGEN MATERIALS											
Ammonia, anhydrous	14	1,990	15,997	38,377	81,462	48,479	67,735	23,205	76,876	2,566	[3] 355,681
Ammonia, aqua: 20-28% N.	0	0	0	164	101	0	4,140	9,952	172,688	44,563	[4] 231,608
Ammonium nitrate	4,611	27,975	95,176	134,220	245,508	290,883	149,132	49,970	117,885	0	1,115,356
Ammonium nitrate-limestone mixtures	131	3,084	297,306	2,628	3,962	48,568	2,017	87	250	0	358,023
Ammonium sulfate	286	8,124	4,670	61,407	8,961	3,618	86,984	70,404	237,784	73,773	519,968
Calcium cyanamide	880	11,282	16,683	2,938	249	15,243	13,552	1,119	6,554	0	68,352
Calcium nitrate	0	32	12,120	60	0	34	96	6,639	36,868	68	55,917
Nitrogen solutions: 20-41% N	28	3,489	13,701	19,566	37,634	1,501	4,218	6,637	21,984	0	[5] 108,758
Sodium nitrate	2,066	14,762	389,010	1,666	170	169,774	56,982	535	436	141	635,542
Urea	311	1,871	4,927	9,376	4,727	1,677	6,340	12,545	18,406	8,805	68,585
Other	40	398	1,702	518	213	7	461	0	0	0	[5] 3,337
NATURAL ORGANIC MATERIALS											
Blood, dried	0	159	29	0	2	0	0	11	1,703	0	1,904
Castor pomace	4,606	128	3,526	0	0	0	0	0	1,256	0	9,516
Compost [6]	22	161	57	5,319	525	1	2,948	0	3,072	0	12,095
Cottonseed meal [7]	7,957	50	1,267	0	0	0	4	0	14	0	9,292
Fish scrap, meal, and emulsions	455	4	1	0	0	0	24	1,430	0	0	1,914
Manures, dried	5,332	12,272	2,961	7,473	5,587	616	2,457	10,509	241,028	3	288,658
Sewage sludge, activated	6,388	13,755	4,263	31,120	11,270	1,218	2,881	2,830	18,259	80	86,794
" , other	0	75	0	1,229	562	0	119	0	30,497	0	32,482
Tankage, animal	0	11	0	0	0	0	0	0	378	0	389
" process	1,954	7,001	2,829	255	0	7	0	1	152	0	12,098
Other [7]	861	1,442	485	0	303	1	0	536	610	30	[8] 4,368
PHOSPHATE MATERIALS											
Ammonium phosphate: 11-48	0	0	0	1,184	17,950	0	1,168	2,754	10,915	2,725	36,694
" " 16-20 [9]	0	0	0	486	71,668	0	67,000	37,746	96,180	247	282,323
" " 13-39	0	0	0	1,344	20,431	0	11,698	2,268	1,460	0	37,201
Ammoniated superphosphate [10]	0	0	1	0	0	0	76	0	10,450	318	10,845
Basic lime phosphate	0	0	412	56	0	0	0	0	0	0	467
Basic slag	0	8,577	24,832	0	0	121,763	4,352	0	0	0	159,524
Bonemeal, raw	256	432	606	137	12	11	89	1	733	0	2,275
" , steamed	1,478	4,145	670	1,483	33	337	527	6	1,157	0	10,036
Calcium metaphosphate	0	227	2,182	10,214	18,502	11,101	1,123	296	87	0	43,710
Fused tricalcium phosphate	0	0	458	106	0	16,908	83	0	0	0	17,155
Phosphoric acid: 28-54% P_2O_5	0	0	0	0	0	0	284	5,703	8,944	660	[11] 15,591
Phosphate rock	619	9,423	19,546	400,726	127,528	6,654	16,267	33	1,836	1,466	583,097
Colloidal phosphate	61	1,114	2,151	6,211	4,325	6,052	370	0	1,292	0	21,556
Precipitated bone	324	0	0	0	0	0	0	0	0	0	324
Superphosphate: 16%	6,338	12,660	36,415	28,766	15,073	18,126	60	210	3,009	1,655	122,310
" 19%	238	1,582	2,620	19	406	206	0	16,249	71,652	0	92,771
" 20-22%	25,778	72,361	44,866	56,774	80,971	82,099	110,766	15,028	7,198	4,820	470,641
" 23-41%	0	4,452	0	3,226	717	21	3,186	2,699	0	0	14,303
" 42-44%	0	0	0	0	17,158	0	0	36,819	10,731	0	64,668
" 45%	9	1,127	145	30,326	76,581	1,806	33,893	12,286	4,026	14	160,012
" 46%	118	56	97	4,777	27,868	5,745	2,094	18,861	11,041	279	70,972
" 47%	0	39	16	4,743	9,012	575	503	2,220	0	0	17,108
" 48%	0	0	279	3,182	3,839	1,191	1,648	94	0	0	10,233
" 49-50%	0	0	61	1,031	3,926	973	3,206	427	0	0	9,624
Other	0	0	0	0	1,806	101	2,442	1,376	460	0	[12] 6,666
POTASH MATERIALS											
Cotton hull ashes	687	2	0	0	0	0	0	0	0	0	689
Lime-potash mixtures: 2-6% K_2O [13]	0	178	18,112	0	0	5,000	0	0	3,539	0	26,829
Manure salts: 20-30% K_2O	0	8	1,855	0	0	2	350	0	0	0	2,215
Potassium chloride: 50% K_2O	0	64	15,215	661	3,060	8,259	7,987	648	809	991	37,694
" " 58-62% K_2O	2,028	3,419	31,323	121,662	29,749	46,995	29,446	484	4,532	12,909	281,409
" magnesium sulfate	202	582	2,252	1,803	764	841	331	16	129	5	6,324
" nitrate [10]	101	6	0	0	0	0	0	0	0	0	107
" phosphate ash [10]	0	0	560	0	0	0	0	0	0	0	560
" sodium nitrate [10]	3	0	16,379	18	0	42	15	0	0	0	16,457
" sulfate	166	792	7,066	1,096	1	9,410	38	802	4,724	1,324	25,118
Other	0	8	4,313	1	0	0	0	0	1,878	451	[14] 6,151
PRIMARY NUTRIENT FERTILIZERS	439,242	2,126,932	6,007,477	4,514,877	2,183,287	2,934,087	1,586,198	398,116	1,838,185	437,346	21,963,597
SECONDARY & TRACE ELEMENT MATERIALS [7]											
Aluminum sulfate	8	8	0	0	0	3	0	0	87	0	106
Borax	107	258	985	121	38	418	21	1	475	0	2,386
Calcium sulfate (gypsum)	217	3,167	68,555	2,038	995	1,467	297	20,925	643,467	0	741,116
Copper sulfate	0	89	289	41	0	2	0	6	121	0	468
Ferrous sulfate	0	0	21	0	0	0	0	14	1,847	2,285	3,865
Magnesium sulfate	55	42	1,938	9	0	0	0	0	38	0	2,080
Manganese sulfate	0	411	173	262	0	0	0	56	396	28	1,326
Mixed minerals	4	0	13	12	0	0	67	48	3,539	0	3,683
Sulfur: 25-99% S	5	140	1,058	110	9	0	284	6,282	13,066	0	20,904
Sulfuric acid: 60-93%	0	0	0	0	0	0	0	0	2,346	0	2,346
Zinc sulfate	0	12	124	1	0	45	15	42	1,613	75	1,925
Other	0	29	0	58	0	0	0	0	0	0	[15] 84
SECONDARY & TRACE ELEMENT MATERIALS	396	4,122	73,074	2,649	1,042	1,922	684	27,373	666,692	2,384	780,308
ALL FERTILIZERS	439,638	2,129,054	6,080,551	4,517,226	2,184,299	2,935,989	1,586,882	425,489	2,204,877	439,730	22,743,705

1/ Includes distribution by Government agencies. Does not include the quantities of materials used for the manufacture of the indicated quantities of commercial mixtures. 2/ Hawaii and Puerto Rico. Data for Alaska not available. 3/ 290,337 tons nitrogen. 4/ 46,617 tons nitrogen. 5/ 38,362 tons nitrogen. 6/ Ammonium sulfate-nitrate 3,019 tons, 16-0-0 material other than sodium nitrate 291 tons, urea flash scrap 27 tons. 7/ Distributed by manufacturers of fertilizers. 8/ Meals: cocoa shell 431, crab 10, hoof and horn 449, linseed 407, soybean 297, tung 119, other seed 483, vegetable 13; peat 116; others classified only by grades 2,096 tons. 9/ Includes quantities reported as 16-20-0 mixtures. 10/ Additional quantities may have been reported as mixtures. 11/ 7,669 tons P_2O_5. 12/ Product classifications withheld to avoid disclosing figures for individual establishments. 13/ Incomplete. Additional quantities are given free to farmers for which no records are kept. 14/ Potassium carbonate 88, potash solution 1,809, tobacco stems 1,362, and wood ashes 2,972 tons. 15/ Magnesium oxide 16, manganese oxide 58, and brucite 11 tons.

Table 6. - Consumption of Primary Plant Nutrients, Year Ended June 30, 1956[1]

TONS

State & Region	In Mixtures: Nitrogen	In Mixtures: P_2O_5 Available	In Mixtures: P_2O_5 Total	In Mixtures: K_2O	In Mixtures: Total N, Avail. P_2O_5, & K_2O	In All Fertilizers: Nitrogen	In All Fertilizers: P_2O_5 Available [2]	In All Fertilizers: P_2O_5 Total [3]	In All Fertilizers: K_2O	In All Fertilizers: Total N, Avail. P_2O_5, & K_2O
Maine	12,469	19,377	20,770	22,291	54,137	13,055	20,207	21,644	22,344	55,606
New Hampshire	797	1,755	1,824	1,906	4,458	1,191	2,512	2,582	1,974	5,677
Vermont	1,249	4,509	4,663	5,136	10,894	1,519	5,089	5,296	5,381	14,539
Massachusetts	4,316	6,807	7,097	6,677	17,800	5,484	8,146	8,568	7,058	20,685
Rhode Island	837	1,494	1,560	1,676	4,007	985	1,606	1,693	1,730	4,321
Connecticut	3,792	5,416	5,860	6,153	15,360	6,176	7,279	7,859	7,395	19,850
New England	23,460	39,367	41,764	43,839	106,656	27,410	47,619	50,542	45,849	120,678
New York	53,697	62,139	66,276	61,418	147,254	41,366	71,582	76,640	62,262	165,210
New Jersey	13,887	27,247	28,184	26,690	67,824	15,924	28,648	30,088	27,806	73,378
Pennsylvania	31,263	75,650	78,275	68,974	175,887	37,320	84,881	89,208	69,901	191,902
Delaware	4,436	10,040	10,469	10,668	26,146	5,641	10,239	10,689	10,778	26,666
District of Columbia	136	208	225	104	448	177	245	272	109	531
Maryland	13,683	33,349	36,484	29,789	76,821	16,470	34,681	37,377	30,035	81,186
West Virginia	3,017	9,104	9,776	7,309	19,430	5,851	10,086	10,814	7,361	21,266
Middle Atlantic	100,121	217,737	228,686	194,962	512,810	121,729	240,332	255,182	197,970	560,091
Virginia	26,416	77,017	82,248	73,049	176,482	40,205	79,721	86,776	75,499	195,425
North Carolina	58,962	140,864	151,558	136,193	336,739	116,188	145,368	156,922	145,902	408,478
South Carolina	23,829	63,676	68,386	66,388	142,892	68,811	66,822	73,903	69,640	206,973
Georgia	42,074	99,327	106,968	97,077	238,478	90,635	106,118	114,566	103,437	300,390
Florida	64,059	74,666	90,820	91,585	230,280	81,205	77,145	97,497	95,338	283,683
South Atlantic	215,320	455,289	499,980	453,292	1,123,871	397,242	476,892	528,664	487,813	1,341,947
Ohio	45,689	140,341	149,917	136,849	322,879	57,656	166,118	187,837	138,781	342,555
Indiana	46,824	149,187	155,219	152,720	348,431	78,785	158,691	170,156	174,188	411,664
Illinois	29,809	76,990	80,232	81,154	187,623	75,351	117,049	128,112	130,884	321,284
Michigan	27,737	86,066	91,740	85,087	200,960	36,821	91,502	96,016	85,730	213,553
Wisconsin	15,193	60,900	64,021	71,816	147,929	20,906	62,182	67,548	74,390	167,047
East North Central	164,652	513,484	541,029	527,606	1,207,722	269,518	575,512	719,667	603,983	1,446,113
Minnesota	15,385	58,759	62,826	42,392	116,606	34,989	78,244	83,492	45,784	166,967
Iowa	27,818	68,600	71,436	62,640	158,858	69,707	100,005	109,478	69,788	219,469
Missouri	34,630	64,865	68,735	52,674	152,169	69,748	75,083	109,454	62,907	207,738
North Dakota	1,785	6,247	6,558	1,328	9,360	4,598	22,529	23,115	1,359	28,286
South Dakota	1,714	5,388	5,642	226	5,337	5,904	8,589	8,998	246	14,709
Nebraska	5,065	9,859	10,066	1,245	16,275	55,794	28,719	29,169	1,450	85,963
Kansas	9,524	19,299	20,419	3,463	32,286	39,572	44,846	47,476	4,121	88,539
West North Central	93,919	230,997	243,676	143,975	468,791	280,262	386,785	409,200	185,656	799,721
Kentucky	18,230	47,174	51,664	46,783	112,187	28,578	60,811	68,218	57,009	146,396
Tennessee	19,237	44,196	49,901	45,046	108,483	41,282	56,228	59,928	52,580	146,291
Alabama	34,743	88,216	95,176	85,768	188,727	85,612	97,604	106,025	71,022	254,438
Mississippi	18,632	30,960	33,375	24,976	74,568	115,285	44,067	48,996	37,306	196,658
East South Central	90,842	212,546	230,116	180,575	483,965	270,962	257,711	283,165	217,919	744,286
Arkansas	9,154	18,729	19,882	19,126	48,989	52,692	25,568	26,755	36,642	114,692
Louisiana	10,870	20,061	21,345	16,375	47,306	53,601	25,828	27,735	19,606	90,732
Oklahoma	4,765	10,452	10,947	4,437	19,654	11,044	20,850	23,208	5,093	36,987
Texas	21,106	41,992	44,162	21,466	84,562	75,835	61,801	67,180	22,822	179,186
West South Central	45,877	91,211	96,314	61,425	198,511	192,570	133,434	144,841	83,863	429,967
Montana	286	637	678	37	959	2,201	7,276	7,489	52	9,528
Idaho	639	862	1,062	111	1,611	19,129	12,072	13,312	162	31,362
Wyoming	277	472	497	50	799	997	3,408	3,462	72	4,474
Colorado	1,415	2,471	2,599	680	4,566	7,468	11,144	11,410	899	19,811
New Mexico	229	314	335	50	593	6,146	7,422	7,634	94	13,662
Arizona	2,723	3,354	3,551	580	6,657	34,496	13,736	14,051	1,191	49,427
Utah	419	824	871	113	1,056	4,499	4,407	4,606	189	9,218
Nevada	57	94	98	21	172	176	328	344	25	526
Mountain	6,043	8,728	9,391	1,642	16,413	75,113	59,841	62,340	2,672	138,026
Washington	2,869	4,648	4,824	3,348	10,865	44,135	14,037	14,584	5,083	63,806
Oregon	1,909	3,376	3,604	2,004	7,289	32,056	15,178	15,676	3,108	48,542
California	25,933	24,712	25,594	13,589	64,234	186,630	69,967	73,101	22,661	281,248
Pacific	30,711	32,736	34,022	18,941	82,388	264,821	97,182	101,361	30,792	393,596
Continental U. S.	770,945	1,806,077	1,924,988	1,626,116	4,201,137	1,897,347	2,264,106	2,574,962	1,854,017	5,986,470
Hawaii	6,545	5,711	5,917	9,506	21,760	22,187	8,828	9,640	18,616	49,610
Puerto Rico	26,065	11,289	12,917	22,248	59,596	41,022	11,428	13,067	22,511	74,761
Alaska [4]	---	---	---	---	---	---	---	---	---	---
Territories	32,590	17,010	18,834	31,749	81,355	63,189	20,256	22,667	40,988	124,371
Total 1954-55	803,541	1,821,087	1,943,822	1,657,864	4,282,492	1,960,536	2,284,362	2,597,649	1,874,963	6,110,841
1953-54 [5]	778,099	1,783,071	1,922,708	1,603,584	4,175,554	1,847,416	2,234,648	2,539,419	1,813,594	5,896,668
1952-53	730,096	1,782,286	1,920,472	1,552,041	4,062,422	1,637,056	2,270,750	2,766,280	1,732,280	5,640,056

1/ Includes Government distribution. 2/ Includes, as available P_2O_5, 2 percent of the colloidal phosphate and 3 percent of the phosphate rock marketed for direct application. 3/ Includes, as total P_2O_5, 22 percent of the colloidal phosphate and 32 percent of the phosphate rock marketed for direct application. 4/ Not available. In 1952-53, total primary plant nutrients in all fertilizers amounted to 275 tons. 5/ Revised: 7,552 tons of the K_2O in mixtures in Florida was originally reported as available and total P_2O_5.

Table 6a—Percent of Increase or Decrease in Consumption of Primary Nutrients in 1954-55 from 1953-54[1]

Region	N		•Available P_2O_5		K_2O	
	Mixtures	Materials	Mixtures	Materials	Mixtures	Materials
New England	9.59	2.97	8.88	29.02	6.98	0.90
Middle Atlantic	9.47	14.69	3.80	−6.86	8.04	−2.71
South Atlantic	1.31	7.21	−1.71	3.47	3.54	5.09
East No. Cent.	5.58	−2.34	5.01	6.56	1.72	2.08
West No. Cent.	−0.49	8.57	−3.27	25.31	4.92	14.04
East So. Cent.	−0.88	4.76	−0.30	−23.87	1.84	1.60
West So. Cent.	5.44	6.09	6.46	5.12	0.63	−7.76
Mountain	−2.48	17.52	−12.17	3.83	4.45	78.82
Pacific	10.02	13.13	11.49	3.30	7.68	13.44
Continental U. S.	3.48	7.80	1.52	5.17	3.41	3.07
Territories	−1.48	25.17	0.72	−0.58	2.18	10.66
United States	3.27	8.20	1.52	5.13	3.38	3.37

[1] Percentages without signs are increases.

Table 7. - Weighted Average Primary Plant Nutrient Content of Fertilizers, in Percent, Year Ended June 30, 1955[1]

State & Region	Mixtures[2]				Primary Nutrient Materials					Average Nutrient Content of Mixtures and Materials
					Single Nutrient[3]			Multiple Nutrient [3]		
	N	Available P_2O_5	K_2O	Average Nutrient Content	N	Available P_2O_5[4]	K_2O		Average Nutrient Content	
Maine	7.12	11.07	12.74	30.93	29.86	19.63	46.10	11.21	20.25	30.51
New Hampshire	5.78	12.75	13.77	32.28	29.48	20.38	54.90	10.76	22.09	29.76
Vermont	4.27	14.70	18.74	36.51	31.50	21.82	57.61	11.47	22.78	30.84
Massachusetts	8.34	10.01	9.82	26.17	20.40	18.98	58.98	11.12	16.76	24.27
Rhode Island	5.73	10.23	11.48	27.44	18.50	17.23	58.57	10.67	16.11	26.11
Connecticut	6.03	8.61	9.78	24.42	22.44	21.55	56.14	12.59	17.67	22.47
New England	6.45	10.78	12.01	29.22	24.26	20.96	56.76	11.96	19.16	27.82
New York	8.19	11.62	9.45	27.06	25.55	20.25	53.64	10.45	21.06	26.25
New Jersey	8.33	10.46	10.24	26.02	24.16	18.97	58.47	11.23	21.80	26.62
Pennsylvania	4.96	12.01	10.96	27.92	27.28	17.07	50.18	10.99	19.84	26.96
Delaware	4.91	11.10	11.80	27.81	33.23	24.18	61.18	9.29	19.75	27.91
District of Columbia	8.54	9.96	8.02	25.52	15.63	10.65	60.40	10.81	11.18	18.90
Maryland	4.59	11.19	10.00	25.78	27.80	16.40	39.15	13.51	22.56	25.58
West Virginia	4.11	12.40	9.95	26.46	25.12	20.70	60.23	9.19	22.18	26.02
Middle Atlantic	5.27	11.47	10.27	27.01	26.40	18.86	52.42	10.40	20.89	26.36
Virginia	3.78	11.03	10.46	26.27	21.05	18.92	13.45	17.04	19.31	24.55
North Carolina	3.98	9.49	9.19	22.65	20.98	17.59	44.33	13.31	21.90	22.61
South Carolina	3.69	9.57	8.89	22.15	20.18	15.36	54.90	27.27	22.79	22.35
Georgia	4.22	9.95	9.74	23.92	23.13	17.66	54.24	21.58	23.63	23.86
Florida	5.79	8.75	9.28	20.82	23.02	8.33	60.06	16.80	19.87	20.70
South Atlantic	4.37	9.24	9.20	22.81	21.46	15.44	42.35	17.95	22.06	22.67
Ohio	4.81	13.95	13.51	31.97	35.02	20.26	54.78	11.85	27.48	31.58
Indiana	4.70	14.06	15.42	35.18	39.64	21.22	61.44	22.91	29.13	35.73
Illinois	8.81	14.38	13.15	36.06	35.90	8.64	61.29	11.35	19.83	26.85
Michigan	4.74	15.06	14.64	34.33	35.61	19.11	48.30	9.79	23.94	33.46
Wisconsin	3.85	15.33	18.06	37.24	46.51	9.30	57.71	10.11	28.04	36.54
East North Central	4.88	14.64	14.98	34.30	37.13	10.32	60.91	12.09	24.01	32.03
Minnesota	4.80	21.10	18.22	41.12	55.03	29.22	59.58	34.49	45.21	42.16
Iowa	7.56	18.80	11.85	37.71	44.26	27.80	57.57	37.23	37.20	37.52
Missouri	7.80	14.24	11.56	33.40	41.85	7.92	59.46	19.51	24.46	30.42
North Dakota	7.54	26.37	8.61	39.52	40.62	45.36	60.57	51.80	48.26	44.96
South Dakota	10.62	20.99	1.46	33.07	45.57	44.36	60.37	58.22	43.06	38.81
Nebraska	10.61	20.71	2.89	34.21	44.86	38.70	60.37	33.92	42.35	40.40
Kansas	10.09	20.45	3.67	34.21	40.81	34.00	60.60	40.69	40.16	37.77
West North Central	7.31	17.96	11.20	36.49	44.44	25.86	58.28	38.97	36.82	36.63
Kentucky	4.59	11.37	11.28	27.04	32.99	23.59	56.61	21.12	31.76	28.01
Tennessee	4.70	11.28	10.81	26.49	33.22	26.14	60.82	12.06	33.11	28.00
Alabama	4.03	10.23	7.62	21.88	23.94	16.71	59.68	12.35	22.19	21.96
Mississippi	5.72	9.50	7.66	22.88	36.20	12.80	56.84	12.23	30.89	27.27
East South Central	4.81	10.86	8.97	24.04	31.08	16.84	55.23	14.29	28.49	25.44
Arkansas	5.84	11.98	12.24	30.06	34.36	34.08	57.84	36.72	38.36	34.46
Louisiana	6.31	11.65	9.61	27.47	37.53	18.02	57.62	32.58	34.64	30.80
Oklahoma	6.88	10.10	6.41	23.39	39.11	22.86	59.50	39.70	30.04	29.14
Texas	6.80	13.61	6.92	27.23	40.75	26.23	58.00	38.58	34.35	30.88
West South Central	6.48	12.88	9.87	28.03	37.47	25.17	57.70	36.00	35.11	31.44
Montana	9.47	21.18	1.23	31.88	32.98	44.97	60.40	46.41	42.31	40.96
Idaho	11.77	15.90	2.06	29.72	29.80	31.12	61.21	37.21	30.81	30.75
Wyoming	13.31	23.63	2.49	39.83	39.26	45.40	60.40	40.61	43.97	43.17
Colorado	10.62	18.37	5.05	33.94	40.36	44.14	63.43	47.00	43.07	40.62
New Mexico	10.76	14.74	2.55	27.84	39.38	36.80	49.89	34.24	42.91	41.93
Arizona	13.00	16.01	2.77	31.78	33.81	36.93	51.83	28.74	32.87	32.46
Utah	11.80	14.38	3.10	29.28	35.70	37.54	60.40	32.58	35.29	34.46
Nevada	8.31	13.70	3.06	25.07	23.38	39.41	57.27	29.18	31.66	29.16
Mountain	11.78	17.01	3.20	31.99	34.12	37.70	53.52	32.89	35.06	34.67
Washington	8.18	13.78	9.54	30.97	35.12	32.39	62.09	34.49	34.89	34.15
Oregon	6.66	15.14	8.89	32.69	30.31	24.87	21.56	37.92	30.94	31.19
California	10.79	10.28	5.66	28.73	29.63	26.11	55.17	12.16	22.66	23.47
Pacific	10.32	11.00	6.36	27.68	30.62	26.96	40.17	14.72	25.02	25.54
Continental U. S.	5.12	11.97	10.79	27.88	31.29	19.31	54.36	21.81	27.97	27.89
Hawaii	10.62	9.27	15.43	35.32	23.39	20.12	58.62	56.20	30.09	32.18
Puerto Rico	11.96	8.18	10.20	27.33	23.24	21.46	56.87	22.00	23.28	26.40
Alaska[5]	---	---	---	---	---	---	---	---	---	---
Territories	11.86	6.08	11.36	29.09	23.31	20.17	58.60	55.06	27.23	28.44
U. S. Average:										
1954-55	5.24	11.86	10.80	27.90	31.00	19.32	54.56	21.64	27.86	27.89
1953-54	5.01	6/ 11.54	9/ 10.32	26.87	30.81	18.70	54.01	17.83	25.99	26.61
1952-53	4.63	11.34	9.87	25.84	28.84	14.49	51.89	21.96	23.24	25.06

1/ Excludes materials not guaranteed to contain one or more of the primary plant nutrients, N, P_2O_5, or K_2O. 2/ Guaranteed to contain two or more of the primary plant nutrients. 3/ Guaranteed to contain one of the primary plant nutrients.
4/ Includes the available P_2O_5 content of colloidal phosphate and phosphate rock as 2 percent and 3 percent, respectively.
5/ Not available. 6/ Revised.

nitrogen and K_2O have each increased from approximately five per cent to nearly nine per cent during this period.

Mixed fertilizers accounted for 40.99, 79.72, 74.83 and 88.42 per cent, respectively, of the nitrogen, available P_2O_5, total P_2O_5, and K_2O consumed in 1954-55. The quantities of these nutrients consumed as mixed fertilizers were, respectively, 3.27, 1.52, 1.10 and 3.38 per cent greater than in 1953-54.

Fertilizer materials for direct application accounted for 59.01, 20.28, 25.17, and 11.58 per cent, respectively, of the nitrogen, available P_2O_5, total P_2O_5 and K_2O consumed in 1954-55. The quantities of nitrogen, available P_2O_5 and K_2O consumed as fertilizer materials were, respectively, 8.20, 5.13 and 3.37 per cent greater, while the quantity of total P_2O_5 was 9.63 per cent smaller than in 1953-54. The percentage change in the quantity of primary nutrients of fertilizer mixtures and materials consumed in 1954-55 as compared with 1953-54 is shown by regions in Table 6a.

The total primary nutrient content of mixed fertilizers consumed in 1954-55 amounted to 4,282,492 tons, or 2.56 per cent more than the consumption (4,175,554 tons) in 1953-54. The total primary nutrient content of fertilizer materials in 1954-55 was 1,837,349 tons, or 6.82 per cent more than the 1,720,004 tons consumed in 1953-54.

The consumption of all fertilizers (mixtures and materials) bearing primary nutrients was 214,589 tons (0.97 per cent) below the 1953-54 level, whereas the total quantity of primary nutrients (nitrogen, available P_2O_5, K_2O) supplied by these fertilizers was 224,283 tons (3.80 per cent) above this level.

Although primary nutrient materials consumed for direct application comprised only 30 per cent of the tonnage of all fertilizers containing these nutrients, they supplied 59 per cent of the nitrogen consumed in 1954-55. Of the various nitrogen bearing products listed in Tables 4 and 5, anhydrous ammonia, aqua ammonia and all nitrogen solutions have contributed increasing portions of direct application nitrogen over the past 10 years.

In Figure 2, there is shown, by states, the nitrogen as anhydrous ammonia and nitrogen solutions (of which aqua ammonia is a part) as per cent of total nitrogen marketed for direct application in 1954-55. There are wide variations in these percentages of nitrogen supplied by liquid nitrogen products. These range from none in most of the states in New England to 74.9 per cent in Minnesota, the highest. The average for the United States and territories is 25.1 per cent supplied by anhydrous ammonia-nitrogen and 7.3 per cent by all other forms of liquid nitrogen. ▲

Chemicals

Arasan 75, Thiram Wettable Powder

DuPont has introduced an improved thiram product for dust treatment of seed, Arasan 75. The increased thiram content (it replaces Arasan which contained only 50 per cent) provides greater protection for certain seeds with less total dust applied.

The new product is a wettable powder facilitating its use in slurry or sprays for some applications.

Formulation Pad Free to Mixers

Nitrogen Division, AC&D, is distributing free of charge a sample formulation pad for use in fertilizer mixing. It can be used as a suggested design in making up your own pads.

Included are 90 identical forms for recording ingredients used in any given mixture and, on the inside covers, three sets of tables give detailed analyses of nitrogen solutions, pounds of each solution required to add specified units of nitrogen and the equivalent acidity or basicity of all commonly used nitrogen carriers.

To obtain the free pad, plant food mixers can

Circle 240 on Service Card

Parzate for Rust On Durum Wheat

Directions on use of Parzate (liquid nabam) fungicide have been registered by DuPont with USDA for use in control of rust in durum wheat. A residue tolerance of one ppm for nabam in wheat has already been established by FDA.

In field tests, Parzate at two quarts per 100 gallons of spray in combination with zinc sulfate was applied at the rate of 20 to 25 gallons per acre in a schedule of two to four treatments. First application was made when rust began to spread through the field with succeeding applications at week to 10 day intervals. Yield increases ranged from three to 17 bushels per acre compared with untreated wheat in which rust was moderately severe.

Sulfi-Down Reagent

Sulfi-Down, a new analytical reagent designed to supplant hydrogen sulfide is described in a new booklet issued by A. Gaigger & Co., Kinzie at Wells St., Chicago 10, Ill. The material can be used to replace not only hydrogen sulfide but also all other reagents designed to supply sulfide ions in chemical procedures.

Dow Chloropicrin

Chloropicrin has been added to the group of fungicides produced by Dow Chemical, under the trademark name Picfume. It will carry directions for use in soil fumigation, fumigation of grain and other stored commodities and for rodent control.

Plant Growth Accelerator

USDA terms remarkable the acceleration of growth in a number of plants caused by a rare and little-known substance. The material offers unusual possibilities as a growth-regulating chemical.

In preliminary greenhouse work, gibberellic acid (one form of the chemical) has doubled or tripled the heights of various kinds of plants with only one minute application. Applied externally to stems of young plants in a lanolin paste mixture, the acid caused ornamentals such as geranium, poinsettia, sunflower, rose, salvia, dwarf dahlia, petunia and aster to grow one-half to three times taller than untreated plants within three to four weeks.

Heights of crop plants such as snapbean, soybean, peanut, pepper, eggplant, corn and barley were in many cases doubled or tripled by similar application of the chemical. During early growth stages, both the weight of fresh soybean and snapbean plants and the amounts of solid matter in them were increased 30 to 40 per cent.

In limited tests with several vegetables including tomatoes, snapbeans and peppers, applying the chemical directly to the fruit did not affect fruit growth. New growth of young forest trees such as willow oak, tulip poplar and maple was greatly increased but similar applications to two species of pine and white spruce caused only slight increase.

In the greenhouse the acid retarded flowering of some ornamentals and crop plants while in others it advanced flowering by one to several weeks.

The acid was first obtained from a fungus of the genus *Gibberella*, long a major disease of rice in Japan causing excessive elongation of the rice plants and reduced yield.

USDA physiologists P. C. Marth, W. V. Audia and J. W. Mitchell, who have been conducting the work, point out that research is in a preliminary stage and no immediate practical use has been developed. A major difficulty is the shortage of the acid and, as yet, methods for large-scale production have not been worked out.

Although initial applications were in a lanolin paste mixture, the researchers have now switched to a more easily applied foliar spray. Only minute amounts of the chemical are required to produce marked effects—as little as one-millionth of an ounce of the acid in an ounce of water caused accelerated growth in some tests.

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

Boll Weevil Reported Heavy

COTTON boll weevils which went into hibernation in record numbers last fall in several states appear to have survived the winter in numbers to be of serious concern to cotton growers. By early June, weevils were numerous in the lower Piedmont area of North Carolina where a higher population was found than any year since 1950. However, in the counties to the east, weevils were not so abundant but easily found in most fields of the coastal area.

In South Carolina boll weevils were sufficiently numerous over the state to warrant blanket insecticidal applications. Cage tests at Florence, S. C., showed a 6.7 per cent survival as of June 8, 1956, as compared with 4.3 as of the same date in 1955. Rains in the Florence area caused a considerable increase in the number of weevils appearing in the fields. In late May and early June reports from Georgia carried information of heavy weevil infestations on cotton. All counties in the state which had been checked reported heavy infestations except three in the northeastern part, Madison, Hart and Elbert. These counties were light to moderate. Alabama also reported numerous weevils appearing in young cotton by late May. Population counts in the central area of the state ranged from 376 to 1,984 weevils per acre. The average was 1,073. In early June, of 17 fields examined in six east-central counties, 13 were infested at the rate of 192 weevils per acre.

Some cotton fields in the delta counties of Mississippi by late May were carrying a higher population of weevils than ever before at that date. Weevils were reported from most cotton fields in the state and some counts reached 3,000 weevils per acre. Fruiting was being retarded in many fields near ideal hibernating areas. By early June weevils were found in 39 of 44 fields examined in the Tallulah, La., area. The average rate per acre was 420 compared with 222 for the same week in 1955 and 419 in 1954. In late May counts of 5 to 10 per 100 of row were recorded in Natchitoches parish. Weevils were also recorded from several other parishes.

Boll weevils were just beginning to appear in Tennessee cotton fields by early June. Feeding signs were beginning to show in southwestern counties but little damage to terminal growth was noted.

Arkansas counts were high though in some sections. Over 2,000 weevils per acre were reported from Chicot county and over 1,500 per acre in Hempstead county. Elsewhere in the state populations ranged from none to light.

Weevils were appearing in Oklahoma with counts of eight per hundred feet of row in Choctaw county. Specimens were also found in LeFlore county.

In Texas local heavy weevil infestations were on the build-up in the lower Rio Grande Valley and light infestations were also reported in the upper coastal area. In the McLennan and Falls counties area, 36 weevils per acre were found in 13 untreated fields and 5 per acre in 10 treated fields. Weevil survival in test cages at Waco to June 8 was .06 per cent as compared to 9.1 per cent on the same date in 1955. The 1956 figure is the lowest since 1951 at this time.

Other Cotton Insect Activity

Bollworms were making their appearance in nearly all of the cotton growing states by the first of June. In the Sahurita area of Pima county, Ariz., light infestations were observed on cotton May 25.

Activity in the lower Rio Grande Valley of Texas increased sharply in late May. A few bollworms were found in the southwestern part of the state and light to medium infestations were reported from Jim Wells county. Houston county reported 12 per cent injured squares. Occasional eggs were being found in the Waco section.

Moths were reported from many fields of the Tallulah, La., area in early June. In the Mississippi delta counties, egg and larvae were found in many fields. Controls were necessary in some fields. The appearance of damaging numbers of bollworms in the delta section of Mississippi is unusual for this time of year.

By early June, eggs were observed in Alabama and Georgia and moths in South Carolina. North Carolina also reported appearance on cotton.

The brown cotton leafworm, which is a relatively new economic pest on cotton, required control in Burleson county, Texas. Light infestations were reported from the Texas counties of Brazos, McLennan, Falls, Denton and Col-

lin. Only an occasional larvae was found in Natchitoches parish, La., where early in May light infestations have been reported. The pest was also reported from Red River parish.

Spider mites were reported as doing localized damage in Maricopa county, Ariz., and the lower Rio Grande Valley of Texas. New Mexico, Alabama, Georgia, Tennessee and South Carolina reported mites present.

In early June thrips damage varying from light to heavy was reported from South Carolina, Georgia, Alabama, Tennessee, Mississippi, Louisiana, Texas, New Mexico and Arizona.

Truck Crop Pests

The Colorado potato beetle was quite active in widespread areas of the United States during late May and early June. In May, very heavy infestations of adults and eggs were reported from a few fields of the Moses Lake, Washington, area. Eggs were also unusually abundant on early potatoes at Zillah, Wash.

By June southwest Idaho recorded the heaviest population in several years. Severe injury was developing in untreated fields of Owyhee and Canyon counties.

Rapid build-up was reported from Okmulgee County, Okla. In Virginia larvae were much heavier than usual and on the Eastern Shore where control was not used, injury to Irish potatoes was noticeable. Infestations were also reported from Maryland, Delaware and North and South Carolina and Missouri.

Flea beetles were damaging to various vegetables in areas of Pennsylvania, Maryland, Virginia and North Dakota. Other truck insects which were causing concern include the Mexican bean beetle in Mississippi, Georgia, North Carolina and Pennsylvania. The bean leaf beetle has caused damage in Delaware, Virginia and Maryland. Infestations were also reported from Illinois and Missouri.

Insects on Fruit

By late May the first larvae of the codling moth were observed at Bridgeville, Del., and first emergence in cages noted in Adams county, Pa.

The first entry in Burlington county, N. J., this year was June 4 compared with a normal of May 25–30. First entry in apples was recorded in early June in Jefferson and Berkley counties, W. Va.

In early June 90 per cent of the moths had emerged in the Carbondale, Ill., area but weather was unfavorable for normal development.

In the Vincennes, Ind., area, emergence is light: however, in Orleans area, situation is such that considerable trouble may be expected in early fall if corrective measures are not taken. In Jackson county, Ore., the first larvae entered unsprayed pear fruits June 2.

The red-banded leaf roller infestation in northwest Missouri is heavy enough to warrant preparation for intensive controls for the next brood. The larvae were mostly full-grown in early June. During this period moths were emerging in the Carbondale, Ill., area, larvae feeding on foliage in Ohio was common and hatching was complete in the Paw Paw, Mich., area.

The Mediterranean fruit fly, which was reported in the last issue of this magazine as having been found in Florida, April 13, 1956, has been reported in 17 Florida counties as of June 16. Counties from which specimens had been identified up to the 16th are: Dade, Broward, Palm Beach, Hendry, Collier, Sarasota, Lee, Highlands, Polk, Hardee, De Soto Charlotte, Manatee, Brevard, Indiana River, Martin and Pinellas.

The heaviest infested counties remain Dade, Broward, and Palm Beach.

Two specimens of Mexican fruit fly have been recently collected at San Ysidro, San Diego county, California. A single adult male was trapped May 25 and a single female on June 6. These are the first Mexican fruit flies trapped in California since August 9, 1954, when one female was taken. An intensive survey and eradication program has been underway in the San Ysidro area since early 1954 when the fly was collected across the border in Mexico. ▲

ORGANIC FERTILIZER MATERIALS

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Equipment & Supplies

For Liquid Ferts.— B & L CoactoR Unit

Still another liquid fertilizer plant is now on the market—a high capacity, continuous flow, neutral solution unit introduced by chemical plants division of Barnard & Leas Mfg. Co.

A unit called the "B & L CoactoR" is the heart of the plant and includes an automatic controlled reaction circuit, evaporative cooling system and all necessary internal piping.

Anhydrous ammonia and phosphoric acid is received by the process unit directly from tank

cars, and a wide range of ammonium phosphate solutions and complete fertilizers can be produced as well as aqueous ammonia.

Controls are pre-set for the desired formula and can be easily changed for producing various solutions. An automatic safety control stops material flow if raw material supply is shut off. For complete details

Circle 241 on Service Card

Baughman Displays New Bulk Bodies

At its recent sales convention Baughman Mfg. displaced its new models of bulk material bodies. One of these, an all-hydraulic screw feed unit features horizontal and vertical body augers that eliminate the need for cross feed mechanisms.

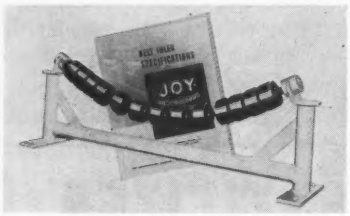
A pneumatic bulk material body permits unloading of bulk feed and similar materials into areas formerly inaccessible to conventional type bulk bodies. Also on display was an improved du-all bulk feed model incorporating a re-designed rear door frame and slide-doors offering greater discharge control of materials.

Joy Mfg. Limberoller Belt Conveyor Idler

Joy Manufacturing's new belt conveyor idler, the Limberoller, has already been adopted by a number of major industrial companies including some in the fertilizer field.

The unit is based on a revolutionary principle of single-roll, load-conforming catenary action and provides a cushioned ride, minimum spillage and wear, savings on purchase and installation, ease of maintenance, simple replacement and long life.

It consists of resilient neoprene or rubber discs molded to a flexible wire rope with a slip-fit, double-row, precision ball bear-



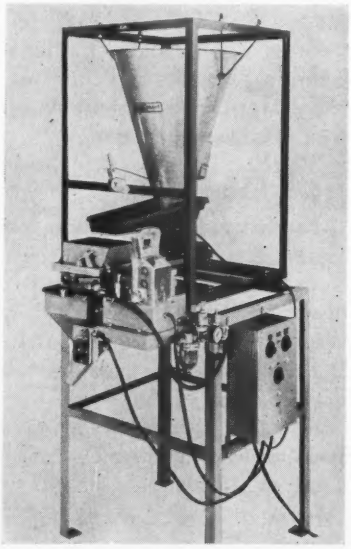
ing on each swaged shak end. A 12 page booklet gives design and application data, specifications tables, descriptions and dimensional drawings. Limberoller idlers and various troughing, impact, training and return brackets are available for belt widths from 18 inches through 72 inches. For a copy of the booklet

Circle 242 on Service Card

New Exact Weight Automatic Machine

The Exact Weight Scale Co. has introduced a new automatic net weighing machine in two models—small capacity for products up to three pounds and a larger one for capacities ranging from three to 10 pounds.

Features include an even balance 1 to 1 ratio precision industrial scale with visual indicator,



net weight hopper and automatic cutoff controls. For efficiency at high speeds it has a fast responding lever system, two rates of feed and fast weight hopper discharge. The feed rates are each fully adjustable to provide bulk and dribble feeds. For literature

Circle 243 on Service Card

Added to Schelm Line

Schelm Brothers has added two types of nitrogen application equipment to its line. The first is an aqua ammonia applicator in which air pressure is used to assure positive application rates. It is available for three or five row coverage.

Also marketed by Schelm is the Krause-Liberty pump for nitrogen solutions, a unit that has received a great deal of publicity since its development. For a catalog covering the complete line

Circle 244 on Service Card

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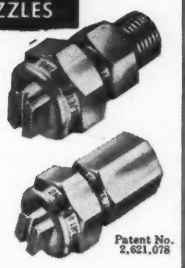

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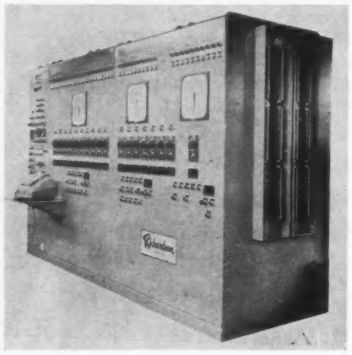
Select-O-Weight Electronic System

Automatic recording of complete formula information, automatic control of a total of 43 feeders and electronic interlocking of all aspects of a complex proportioning system are features of a new electronic Select-O-Weight system recently completed by Richardson Scale. Designed for proportioning grain and feed formulas in a large mill, it includes a printing mechanism interlocked with the automatic panel to record formula data.

The system is designed for full-automatic or semi-automatic operation. Under full-automatic, a



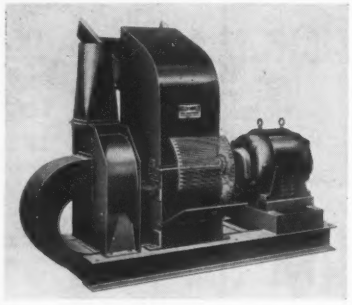
formula is set on the control dials and the system set to repeat the formula as many times as desired. As a semi-automatic unit, the operator sets the control dials each time a formula is fed into the system.

A three scale weighing system is used, the first proportioning any 10 ingredients from 23 feeders, the second any seven of 10 and the third any one of 10. For more information

Circle 245 on Service Card

Kelly Hammer Grinder

A recent Duplex Mill & Mfg. introduction, the Kelly Duplex Industrial Hammer Grinder is available in five models with



throat openings from 12 to 24 inches and in a motor range from 30 to 150 hp.

In this unit, all grinding is done in mid-air as swinging hammers of special abrasion resistant alloy steel repeatedly strike the material while it is in suspension. The screen, perforated to the degree of fineness desired, can be changed in under 30 seconds without removing the mill cover.

Arc welded steel construction is used throughout and the mill body is made of extra heavy steel plate mounted on a structural steel base. Self-aligning ball bearings are included and all points of wear are specially reinforced. For complete information

Circle 246 on Service Card

Continental Adds Perma-Lined Cans

Continental Can has produced a high-bake "Perma-Lined" steel shipping container especially suited for products requiring permanent lining protection from the metal used in producing the pail.

Tough enamels are airless hot-sprayed within the formed container and fast-baked to cover the surface. By eliminating the use of compressed air for atomization of the enamel and subsequent lack of turbulence in the spray pattern, a thick coating of greater uniformity is achieved.

The containers are offered in an open top lug cover style (sizes from two gallon through 12 gallon) and a closed head drum style in a five gallon size. They can be shipped in mixed cars with other types of containers. If interested

Circle 247 on Service Card

New Carboline Lining

Carboline Co. has announced a two-coat heavy-duty maintenance system with a total thickness of 12 mils, designed for protection in severe corrosive environs.

A modified phenolic, Phenoline 305, is applied at six mils per coat with coverage of 200 sq. ft. per gallon. Its high solids content results in a dense, nonporous film with outstanding resistance to splash, spillage and fumes of most acids, alkalies and solvents.

Circle 248 on Service Card

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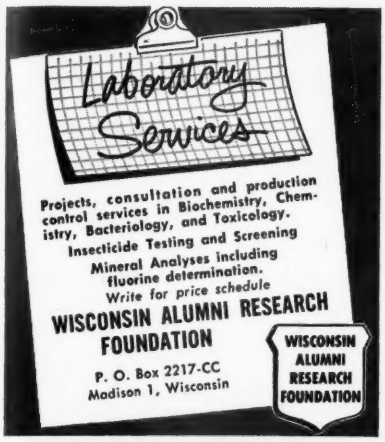
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Suppliers' Briefs

Chase Bag Co. Lee S. Ralph has been named sales manager of the St. Louis, Mo. branch, moving from the New York sales office. The territory includes portions of Mo., Iowa., Ill., Ind., Ky., Tenn. and Ark.

Chemical Eng. Service, Div. of Manitowoc Shipbuilding, Inc., is now in operation supplying dryers, coolers, granulators, complete shipping and mixing units, hopper systems and other fertilizer plant equipment. The division is headed by R. W. Phillips who formerly operated his own Green Bay, Wisc. firm and constructed some 28 new and remodeled plants.

The new agreement combines Phillips' designs and industry work with the Manitowoc, Wisc. firm's facilities for construction of heavy industrial equipment.

Clark Equipment Co. has named Lift Truck & Service Co. of North Little Rock, Ark. to sell and service its Industrial Truck Div. line of fork-lift trucks, powered hand trucks and straddle carriers.

Fulton Bag & Cotton Mills. Stock control of this concern, involving some $10 million, has been purchased by a group of industrialists. A majority of the officers of the old company were reelected to their former positions by the new board headed by Julius W. Abernethy of Newton, N. C.

Frank G. Hough Co. in the first six months of its fiscal year ended April 30 shipped 50 per cent more Payloaders than in the corresponding period of last year. Deliveries and production in 1955 were the largest in the history of the company and the present backlog of orders is at a new high.

Joy Mfg. Co. has appointed John P. Cartwright as sales manager, industrial sales, with headquarters in the Pittsburgh general offices. Arnott J. Lee succeeds him as Washington, D. C. district manager.

Union Bag & Paper Corp. Directors of this company and Camp Mfg. Co., Inc. have approved in principle a plan for a combination of the two companies. They would either be merged or the assets of Camp would be acquired by Union in exchange for stock of Union and the assumption by Union of all Camp liabilities.

The combined company, Union Bag-Camp Paper Corp., would have four divisions—Union Bag & Paper, Union Board & Box, Union Chemical, and Camp.

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by Dr. Melvin Nord

PATENT REVIEWS

New Process for Granular Potash

It has long been known that coarse granular potash, mesh size between 3 and 20, is desirable for agricultural use. In US 2,733,809 issued Feb. 7, 1956 to Edgar E. Wrege and Albert Adams, assigned to International Minerals & Chem. Corp., granular sylvite from Carlsbad, N. M. ores, is concentrated by flotation.

Practically all flotation cells designed in the past have been limited to the handling of ores crushed to a size range finer than 10 mesh. In a coarse granular flotation difficult conditions result from the size and weight of the particles. It would be impractical to try to keep the coarse granular particles in suspension. The tails drop rapidly to the cell bottom where they must be removed immediately to prevent accumulation.

Also, instead of one air bubble floating several particles, a number of bubbles are required to float each granular particle, thus necessitating much more efficient aeration.

Figs. 1 and 2 show the apparatus used. The ore, slurried with a flotation agent such as *n*-lauryl amine, enters through pipe 28 and is agitated and aerated in tube 23. The treated material is discharged through slots 24 into the space between inner tube 23 and outer shell 10. During this operation a brine solution is pumped through right 23 and ports 36 into the same space.

The brine floating upward entrains the materials issuing through slots 24. The aerated coarse particles caught in the upward stream are carried over the weir wall 17 into a trough from which coarse solids are withdrawn through outlet 21.

Unaerated particles generally travel in the upward sweeping brine stream for an appreciable distance then move to a more quiescent zone and settle down into the bottom 12 of outer shell 10 and are withdrawn as tailings through discharge outlet 13.

Du Pont Assigned Substituted Ureas

US 2,733,988 issued, Feb. 7, 1956 to Norman E. Searle and assigned to E. I. duPont de Nemours & Co., describes a class of poly-substituted methyl urea herbicides with this general formula

where R is an acrylic aliphatic radical containing 2–6 carbon atoms, R′ is hydrogen or methyl and R″ is hydrogen or an aliphatic radical of 1–4 carbon atoms, with the proviso that at least one of R′ and R″ is hydrogen.

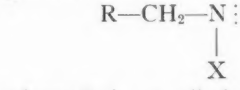
Improvements in Alanap Herbicides

US 2,736,646 and 647 issued Feb. 28, 1956 to Allen E. Smith, Albert W. Feldman and Gracie M. Stone, assigned to US Rubber Co., describes improvements in N-1-naphthyl-phthalamic acid herbicides.

In the first, aluminum sulfate or nitrate or ferric chloride is added to reduce leaching of the acid in the soil and in the second, the acid is occluded in an organic acid such as stearic for the same purpose.

Monsanto General Purpose Weedkillers

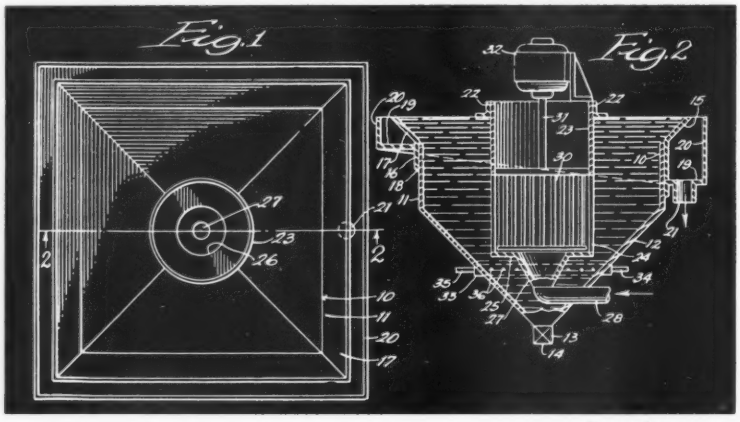
US 2,734,815, issued Feb. 14, 1956 to David T. Mowry and Arthur H. Schlesinger, assigned to Monsanto Chem. Co., describes a new class of herbicides with high efficiency against both broad and narrow leaved plants. The general formula is



where R is an alkyl-substituted phenyl radical or an alkyl-substituted naphthyl radical (1–3 alkyl substituents, and 1–12 carbons per alkyl), X is chlorine or bromine and N⋮D represents a heterocyclic nitrogen compound or the pyridine series.

Plant Regulators

US 2,734,816, issued Feb. 14, 1956 to John W. Wood, Thomas D. Fontaine and John W. Mitchell, assigned to Secretary of Agriculture, describes a class of plant regulating compounds which are N-substituted amides of carboxylic acids, in which the amino nitrogen is that of an optically active amino acid. ▲



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Fertilizer Materials Market

New York

June 12, 1956

Sulfate of Ammonia. Since the price reductions announced about 30 days ago, demand has picked up slightly in some directions and some producers are willing to sign contracts for the balance of the year based on present prices.

Ammonium Nitrate. Recent price reductions were made at some points amounting to about $10 per ton to bring this material in line with other nitrogen compounds.

Anhydrous Ammonia. One large producer announced price reductions of about $5 per ton, effective at once and other producers are expected to follow.

Urea. Limited demand noted from industrial buyers but fertilizer buyers show little interest.

Nitrogenous Tankage. With the market quoted at from $3 to $4 per unit of ammonia ($3.64 to $4.86 per unit N) according to shipping point.

Castor Pomace. Demand has slowed down for castor pomace but production has also declined and little activity is reported. Last sales on basis of $40 per ton, f.o.b. production points.

Organics. As the fertilizer season is almost completed, demand for organic fertilizer materials slowed down and most buyers preferred to wait before contracting for future. Last sales of tankage were made at $4.25 per unit of ammonia ($5.16 per unit N) f.o.b. Eastern shipping points and blood was sold at $4.50 per unit of ammonia ($5.47 per unit N). Soybean meal remained firm in price at $60 per ton in bulk, f.o.b. Decatur, Ill., and scattered sales were made of cottonseed meal with export demand for linseed meal holding up well.

Fish Meal. This material, after selling at $142 per ton f.o.b. fish factories, recently declined in price to $134 and demand was said to be poor.

Bone Meal. This market showed little signs of life, although some bone meal is being moved to the feed trade at $55 per ton, f.o.b. shipping points. Fertilizer demand is slow.

Hoof Meal. No change reported in this market on basis of last sales at $6.25 per unit of ammonia ($7.59 per unit N), f.o.b. Chicago, with demand limited at present time.

Feather Tankage. Some trading was done at $4.50 per unit of ammonia ($5.47 per unit N) delivered Eastern points.

Superphosphate. Many of the Florida phosphate mines are shutting down for an indefinite period because of the poor demand for superphosphate and also large stocks on hand.

Potash. Most domestic producers have announced their price schedules for the coming season with practically no price changes. Chemical grade muriate of potash was advanced about $2 per ton.

Philadelphia

June 12, 1956

The materials market remains quiet and inventories are large. Following the recent reduction in sulfate of ammonia price, it is now reported that anhydrous ammonia will be reduced $5 per ton, effective July 1. Recent improvement in fish catch has brought a price reduction. No price changes have as yet been suggested for urea, nitrate of ammonia, nitrate of soda and muriate of potash. Packing-house by-products are weak.

Sulfate of Ammonia. Recent price cut is scheduled to continue through the coming season, and there has been no spurt in demand because of price.

Ammonium Nitrate. Production continues fairly ample with inventories on the plentiful side, no price changes.

Nitrate of Soda. Supply continues quite sufficient with demand very slightly improved, and no price changes.

Anhydrous Ammonia. Price is said to have been reduced $5 per ton, down to $80 per ton, f.o.b. producing plants, effective July 1.

Blood, Tankage, Bone. These by-products are quite dull with bone meal weak at $55 per ton. Blood and tankage are in poor demand at $4 to $4.25 per unit ammonia ($4.86 to $5.16 per unit N) in the East, and $5 to $5.25 ($6.08 to $6.38 per unit N) in the West.

Castor Pomace. This is reported in scarce supply with latest sales at $35 per ton.

Fish Scrap. Reports of improvement in the catch have materially eased quotations which are now down to $132 per ton for scrap, and $136 per ton for menhaden meal.

Phosphate Rock. Situation is reported quiet without indication of any change in prices.

Superphosphate. While export demand is said to be fairly good, domestic is rather slow. Supplies are plentiful and price schedule undisturbed.

Potash. Recently issued pricelists indicate no changes for coming year. Stocks are fully adequate to meet all normal demands.

Statistics

Aikman Views N Surplus for 1955-56

World production of nitrogen in 1955–56 (excluding Soviet Russia) will total 7,930,000 metric tons—670,000 tons over consumption during the year, according to Aikman (London), Ltd. Some 6,590,000 metric tons will be slated for agriculture, it is estimated, where consumption will reach 5,920,000 tons.

Six months ago Aikman forecast an increase of six per cent in consumption of nitrogen by US agriculture. After reviewing the surplus situation and falling farm prices Aikman concludes, "it now seems probable that this will turn out to be a reduction of at least 12.5 per cent as compared with last year."

'55 Super Output Tops 1954 Figure

Total production of superphosphates in 1955 (100 per cent APA) reached 2,310,499 tons, compared to 2,214,710 tons in 1954. The output figures included: normal superphosphate, 1,557,073 tons; enriched super, 39,042 tons; concentrated super, 706,584 tons; wet-base goods, 7,800 tons; and 92,449 tons of other phosphatic fertilizers (reported for the last six months of 1955).

Shipments of 1,490,725 tons comprised 837,506 tons of normal material, 14,130 of enriched, 632,327 of concentrated, 6,762 of wet-base and 73,384 (six month figure) of other phosphatic materials.

Stocks on hand at the end of 1955 totaled 376,099 tons, an increase from the 326,579 figure reported at the end of the previous year.

March Shows Gains

Production of 250,208 tons (100 per cent APA) of superphosphate and other phosphatic fertilizers in March was an increase of three per cent over the February figure. Shipments totaled 219,033 tons, up 22 per cent from the previous month. Stocks on hand at the end of the month were down 14 per cent from February 29.

Preliminary totals covering July, 1955 through March, 1956 show these percentage changes from the previous comparable period:

Grade	Production	Shipments
Normal	+ 1	+ 4
Enriched	−27	−10
Concentrated	+19	+11
Wet-base goods	−34	−51

Calif. & Ky. Report Fert. Sales Drop

In California, fertilizer sales dropped slightly during the first quarter from the 1955 period. A total of 280,853 tons are reported compared to 283,155 for the 1955 quarter.

January through April figures released by Kentucky also show fertilizer sales trailing the comparable 1955 period. Sales of mixtures are set at 224,609 tons (compared to 226,411) and straight materials at 49,326 tons (61,442 in the 1955 quarter).

Production — March, 1956

Compiled from Government Sources

Chemical	Unit	March 1956	March 1955	February 1956
Ammonia, synth. anhydrous	s. tons	[1]313,048	285,239	*286,743
Ammonia liquor, coal & Coke (NH_3 content) (Including diamm. phosphate & ammon. thiocyanate)	pounds	3,869,113	3,564,826	3,573,177
Ammonium nitrate, fert. grade (100% NH_4NO_3)	s. tons	[2]194,498	158,285	*166,974
Ammonium sulfate				
synthetic (technical)	s. tons	98,910	115,606	104,395
coke-oven by-product	pounds	167,737,192	166,258,291	158,135,855
BHC (Hexachlorocyclohexane)	pounds	7,946,551	3,045,914	5,964,043
Gamma content	pounds	1,223,456	547,354	899,911
Copper Sulfate (Gross)	s. tons	———	6,904	———
DDT	pounds	11,083,360	10,456,387	10,742,191
2,4-D Acid	pounds	2,521,997	3,314,507	2,500,072
esters and salts	pounds	2,038,719	2,807,512	2,093,147
esters and salts (acid equiv.)	pounds	1,622,942	2,098,813	1,654,742
Lead Arsenic (acid & basic)	s. tons	810	1,328	560
Phosphoric acid (50% H_3PO_4)	s. tons	331,582	312,208	313,691
Sulfur, Native (Frasch)	l. tons	———	434,568	476,313
Recovered	l. tons	———	33,700	37,100
Sulfuric acid, gross (100% H_2SO_4)	s. tons	1,441,266	1,387,831	1,350,401
Superphosphate (100% APA)	s. tons	250,208	228,764	*243,934
Normal (100% APA)	s. tons	154,392	158,555	*147,584
Enriched (100% APA)	s. tons	1,623	4,164	1,736
Concentrated (100% APA)	s. tons	74,414	65,286	*75,965
Wet Base (100% APA)	s. tons	424	759	279
Other phos. fertilizers		19,355	———	*18,370
2,4,5-T Acid	pounds	375,150	207,464	403,557
Urea	pounds	71,934,920	———	66,383,100
Calcium Arsenate	pounds	962	———	1,053

* Revised. [1] Includes quantities for 4 plants previously not reporting. [2] Includes quantities for 1 plant previously not reporting.

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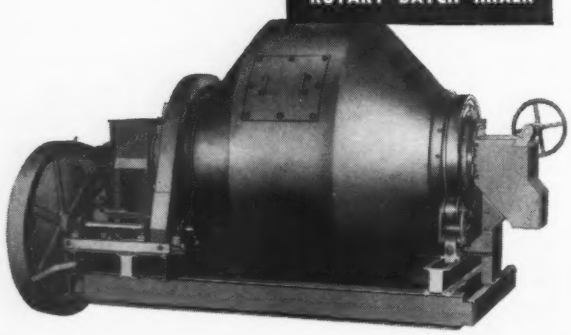

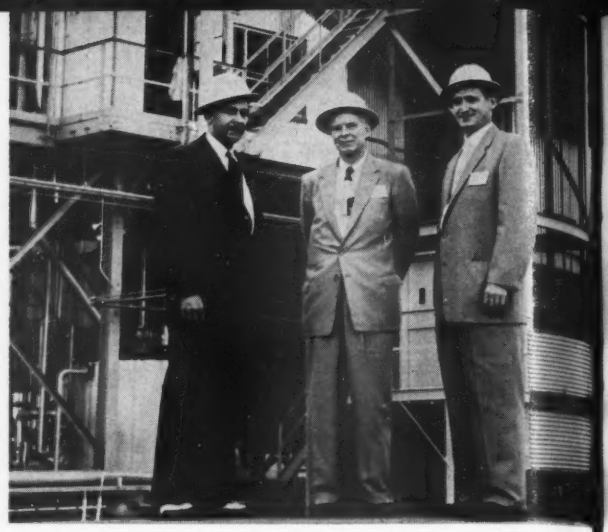

Mercer Rowe, Jr., Ashcraft-Wilkinson vice pres.; John O. Hardesty; and D. J. Stark, Escambia Bay vice pres.

Hardesty Addresses Escambia-A/W Meet

ESCAMBIA Bay Chemical Corp. and Ashcraft-Wilkinson Co. were joint sponsors of a recent Pensacola, Fla., technical meeting attended by over 70 plant superintendents and technical men employed by Southeast fertilizer companies. Principal speaker at the affair was USDA's John O. Hardesty who discussed "Trends in Processing of Mixed Fertilizers."

The guests were also taken on a conducted tour of the Pensacola plant and heard a panel discussion with Hardesty; Dr. Wm. L. Pritchett, University of Florida soil chemist; C. T. Nixon, Ashcraft-Wilkinson, moderator; and J. H. Paul of Escambia Bay. A dinner party and luncheon completed the affair.

Hardesty noted the factors that have aided to development of new mixed fertilizer processes—the greater quantities of concentrated materials, the need for improvement in storage and drilling properties of high-analysis mixtures, and development and utilization of equipment for granular production.

Reduction in the use of liming materials in mixed fertilizer, he added, would permit manufacture of higher analysis products while decreasing unit plant food cost to farmers. Another advantage would be the possibility of including large proportions of low-cost nitrogen in his products.

The USDA scientist also commented that while conventional conditioning agents will alleviate caking to some degree, according to experimental and commercial evidence, they will not prevent it under all conditions of manufacture and storage. Granulation has been adopted, he continued, as the most satisfactory way of improving the storage properties and drillability of mixed fertilizers, and the products are easily conditioned with coating agents. ▲

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editorial

ONLY minor changes in the fertilizer-pesticide mixtures situation were reported in Rodney Berry's latest compilation of information gathered from state control officials. Figures presented by the Virginia control officer show that these mixtures are now sold in 39 states, a gain of four from the Spring, 1955 survey and that one or more of the combinations are recommended by the agricultural experiment stations of at least 19 states.

Registration of the mixtures under fertilizer legislation is required in 38 of these states and pesticide law registration must be made in 23, comparing with 34 and 21 respectively as reported in last year's survey.

Some states continue to report little interest in the combination. In California they are termed "still of little consequence" and most products sold are only for lawn use and compliance is required with both fertilizer and pesticide laws. The status in Delaware is almost the same and most mixtures there have been sold for weed control on lawns and golf courses. No definite action has been taken on regulations although the subject has been considered.

Mississippi reports that there have been no requests for registration of a fertilizer-pesticide mixture but if one was received and granted the material would be registered under both fertilizer and pesticide legislation and fees would be collected under the regulations of each.

No registration requests have been received in New York for mixtures on food crops and such applications would be referred to the state experiment station and college of agriculture before acceptance. Mixtures for use on lawns, turfs and golf courses are permitted.

Payment of fees and/or tonnage taxes according to fertilizer laws is mandatory in all states in which the mixtures are sold and pesticide law fees must also be paid in states where registration under such laws is required.

Regulations covering sale of the materials have now been developed in 11 states, a gain of one over 1955 reports. In Maine such rules are now under consideration, and general regulations governing the mixtures and other products are being developed in Minnesota.

Bulk sales are now permitted in 20 states, one more than reported last year. One state, North Carolina, advises against such sales.

"Buyers" or "Farmers" mixtures may be sold in 24 states, the same number as in 1955, and are subject to regulation under pesticide and fertilizer laws in 14 states. The Maryland control official states that sale of such products in his state is discouraged.

Most sales in Oregon are reported of the custom mix variety and suppliers are reported to have voluntarily undertaken to attach warning labels to such materials.

Reviewing labeling requirements, officials in 33 states noted that an ingredient statement covering both types of active ingredients is required. Directions for use are necessary in 30 states and a warning statement in 28. This compares with 1955 figures of 27, 23 and 25 respectively.

COMMENTING on experiment station recommendations, Louisiana states that the station has recommended only one mixture for use on one crop—an approved fertilizer grade with aldrin, for use on sweet potatoes. In Tennessee registrations have been accepted for both materials recommended by the state experiment station and those that have not. The control official states that his office has requested the station make more extensive recommendations.

Only one mixture is recommended by the Virginia experiment station and no others may be sold or distributed. Fertilizer grades 0-14-14, 0-10-20 and 2-12-12, containing eight pounds of aldrin or heptachlor per ton, are recommended for use on peanuts in the control of southern corn root worms.

Aldrin presents a commanding lead among pesticides used in these mixtures on food crops, according to the number of states reporting specific materials on the market. A total of 30 states named aldrin, while chlordane was cited in 14, heptachlor in 12 and dieldrin in 6. Others listed were DDT, lindane, toxaphene, parathion, BHC, IPC and zineb.

G. P. T., JR.
Editor

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chemical Co., Agr. Chem. Div., N.Y.C.

AMMONIA—Anhydrous and Liquor
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

BAGS—BURLAP
The Burlap Council, New York City
Chase Bag Co., Chicago, Ill.

BAGS—COTTON
Chase Bag Co., Chicago, Ill.

BAGS—Multiwall-Paper
Chase Bag Co., Chicago, Ill.
Kraft Bag Corporation, New York City
Union Bag & Paper Corp., New York City

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
E. D. Coddington Mfg. Co., Milwaukee, Wisc.
Kraft Bag Corporation, New York City
Stedman Foundry and Machine Co., Aurora, Ind.
Union Bag & Paper Corp., New York City

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.

BIN LEVEL CONTROLS
Stephens-Adamson Mfg. Co., Aurora, Ill.

BIN DISCHARGERS
Stephens-Adamson Mfg. Co., Aurora, Ill.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BOX CAR LOADERS
Stephens-Adamson Mfg. Co., Aurora, Ill.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa

BULK TRANSPORTS
Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

CALCIUM AMMONIUM NITRATE
Atkins, Kroll & Co., San Francisco, Calif.
McIver & Son, Alex. M., Charleston, S. C.

CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.

CALCIUM NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

CAR PULLERS
Stephens-Adamson Mfg. Co., Aurora, Ill.

CARS AND CART
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS
Shuey & Co., Inc., Savannah, Ga.

CHLOROBENZILATE
Geigy Agr. Chems. Div. Geigy Chem. Corp., N.Y.C.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
H. J. Baker & Bro., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Finlay, Ohio

CONVEYORS
Baughman Mfg. Co., Jerseyville, Ill.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE
Phelps-Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.

DIAZINON
Geigy Agr. Chems. Geigy Chem. Corp., N.Y.C.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chem. Corp., Agr. Chem. Div., N.Y.C.

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

DITHIOCARBAMATES
Berkshire Chemicals, New York City

ELEVATORS
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ENDRIN
Shell Chem. Corp., Agr. Chem. Div., N.Y.C.

ENGINEERS—Chemical and Industrial
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid
Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—MIXED
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FILLERS
Bradley & Baker, N. Y. C.

Fish SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Tennessee Corp., Atlanta, Ga.

HERBICIDES
American Potash & Chemical Corp., Los Angeles, California
Lion Oil Company, El Dorado, Ark.

HERBICIDES—Oils
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., N. Y. C.
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.
Shell Chem. Corp., Agr. Chem. Div., Denver ,Colo.

IRON CHELATES
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LABORATORY SERVICES
Wisc. Alumni Research Foundation, Madison, Wisc.

LEAD ARSENATE
American Agricultural Chemical Co., N.Y.C.

LIMESTONE
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Finlay, Ohio

MACHINERY—Acid Making and Handling
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing
Bradley Pulverizer Co., Allentown, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

Buyers' Guide

MACHINERY—Material Handling

Clark Equipt. Co., Construction Mach. Div., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.
Tractomotive Corp., Deerfield, Ill.

MACHINERY—Mixing and Blending

Munson Mill Mach. Co., Utica, N. Y.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging

Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY
Superphosphate Manufacturing

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MAGNESIUM SULFATE

Berkshire Chemicals, New York City

MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

MANURE SALTS

Potash Co. of America, Washington, D. C.

METHOXYCHLOR

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.

MINOR ELEMENTS

Geigy Agr. Chems., Div., Geigy Chem. Corp. N.Y.C.
Tennessee Corporation, Atlanta, Ga.

MIXERS

Munson Mill Mach. Co., Utica, N. Y.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF POTASH

Berkshire Chemicals, New York City

NITRATE OF SODA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Company, El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

NITROGEN MATERIALS—Organic

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Sons, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION

Ashcraft-Wilkinson Co., Atlanta, Ga.

PHOSPHATE ROCK

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate

American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
National Potash Co., N. Y. C.
Potash Co. of America, Washington, D. C.
United States Potash Co., N. Y. C.

POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

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REPAIR PARTS AND CASTINGS

Stedman Foundry and Machine Co., Aurora, Ind.

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Baughman Mfg. Co., Jerseyville, Ill.

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STORAGE TANKS

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American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N

Cole, R. D., Manufacturing Co., Newnan, Ga.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.

TRUCKS—SPREADER

Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS

Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div. Allied Chemical & Dye Corp., N.Y.C.
Sohio Chemical Co., Lima, O.

UREA-FORM

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